Volume 2 - Buffalo Harbor Center Themed Visitor Attraction Study-Feasibility and Economic Impact Analysis

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Volume 2
BUFFALO HARBOR CENTER
THEMED VISITOR ATTRACTION STUDY
Buffalo, New York
Feasibility and Economic Impact Analysis

Prepared for
CAMBRIDGE SEVEN ASSOCIATES, INC.
August 1992
On Behalf of
HORIZONS WATERFRONT COMMISSION

Prepared by
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"A harbor . . . is a good thing, since adventures come into it as well as go out, and the life in it grows strong, because it takes something from the world and has something to give in return."

---Sarah Orne Jewett [1849-1909]

*Country Byways. River Driftwood.*
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Section 1

INTRODUCTION

The city of Buffalo, New York, is situated at the heart of the nation's largest tract of undeveloped urban waterfront--some 90 miles of shoreline--extending along Lake Erie, the Niagara River, and the Buffalo River in Erie County. This invaluable natural resource, much of which has been abandoned for several decades and virtually cut off from public access and enjoyment for more than 160 years, has recently become the focus of a comprehensive planning program designed to restore its deserved prominence in the economic and recreational life of the city. Charged with implementing waterfront rejuvenation is Horizons Waterfront Commission, established as a subsidiary of the New York State Urban Development Corporation under legislation sponsored by veteran Congressman Henry J. Nowak of New York's 33rd Congressional District. Representative Nowak, Chairman of the House Subcommittee on Water Resources, has long been an advocate of water management, pollution abatement, and environmentally responsible waterfront development efforts in the Great Lakes region. Under the auspices of the Commission, a draft Action Plan encompassing goals, a generalized land use scheme, and an implementation strategy for the 90-mile zone was approved in May 1991; various elements of this overall plan are now undergoing more detailed study.

A key component of the Action Plan is a major recreational complex proposed by Representative Nowak for Buffalo's downtown harbor at the hub of the larger waterfront study zone. To include an aquarium, a hands-on industry and technology center, a large-format film theater and planetarium, and an environmental education and research center as focal attractions, this complex--known as Buffalo Harbor Center--would serve as a catalyst for tourism and economic development on the waterfront while simultaneously providing Buffalo with a highly visible symbol of its historic importance as a gateway to the Great Lakes. The umbrella theme of the complex would be the "Great Lakes ecosystem," a multidisciplinary presentation of the interrelationships of water, land, animals, and man. Horizons Waterfront Commission retained Cambridge Seven Associates, Inc. to develop a concept and illustrative facilities program for the attraction, which in turn engaged Harrison Price Company
(HPC) to conduct a feasibility analysis and economic impact assessment of the project based on the envisioned concept.

This report contains the findings of HPC's analysis. Following this introduction, Section 2 presents a brief summary of major conclusions and recommendations. The attraction concept and its site environment are the subject of Section 3, while Section 4 addresses resident and tourist market support available to the project. Section 5 then develops attendance forecasts and translates these estimates into physical sizing guidelines for major project components. The financial performance of the project is analyzed in Section 6, and the report concludes with an economic impact assessment in Section 7.

The conclusions set forth in this report are based on HPC's knowledge of the Buffalo area marketplace and its implications for the subject attraction as of completion of field research in July 1992. As in all studies of this type, projected results are contingent on competent and efficient management of the attraction and presume no significant change in competitive position from that described here. The study makes no allowance for possible government restrictions on the project. Further, since attendance and financial forecasts are based on data and assumptions that are inherently subject to interpretation with varying degrees of reliability and confidence, especially at this early stage of planning, they are explicitly not represented as results that will actually be achieved.

HPC wishes to express its appreciation to the organizations and individuals contacted during the course of the research program, most particularly Thomas D. Blanchard, Jr., President, and his helpful staff at Horizons Waterfront Commission.
Section 2
EXECUTIVE SUMMARY

Major conclusions of HPC's feasibility and economic impact analysis of the Buffalo Harbor Center themed visitor attraction are briefly highlighted in this section of the report. No attempt is made here to describe findings in detail or to present supporting documentation, which are fully set forth in the main body of the report.

• By the year 2000, the total market available to the project will approximate 13.8 million, including some 1.8 million people residing within 50 miles of downtown Buffalo and an estimated Niagara Frontier tourist market of about 12 million.

• Included within the resident market population are some 277,000 children enrolled in public and private schools in the region, who comprise a key submarket given the educational mission of the attraction.

• The tourist market, largely centered in Niagara Falls at the present time, is intensely competitive and splintered among a diversity of commercial, natural, and cultural attractions, a finding which dictates a conservative approach to attendance forecasting.

• Key assumptions underlying attendance projections for Buffalo Harbor Center are that it will be developed to high standards of quality, that sufficient public funds and/or private philanthropy will be available to achieve this quality standard, that it will be expertly managed and aggressively promoted, that ticket pricing will be attractive and commensurate with the entertainment value delivered, that the facility will operate year-round, and that a strong educational program will be established.

• Based on the experience of comparable attractions in other locations and the above assumptions, potential annual attendance volume is
projected at a range of 1.3 million to 1.6 million, with a mid-range estimate of about 1.4 million. Visitation of this magnitude has important implications on the size and, hence, the cost of building Buffalo Harbor Center. As a prudent strategy in light of the competitive environment and recognizable constraints on raising the substantial public and private funding necessary to implement the project, HPC recommends gearing a first-phase program to the more conservative attendance target of 1 million visitors annually. Planning guidelines to be presented subsequently are based on this first-phase goal.

- Tourists will comprise roughly two-thirds of total attendance in concert with the relative size of this population in the overall market.

- Expected patterns of attendance suggest that the average maximum number of people in the complex at the peak hour of operation (a typical Saturday afternoon in July) will amount to 3,400 visitors under the mid-range projection. This figure represents the simultaneous holding capacity requirement of the attraction—the sum of all lobbies, exhibit galleries, food service and merchandise sales facilities, general circulation, and other spaces open to the public.

- Based on estimated rates of visitor participation in various activities to be offered at Buffalo Harbor Center, recommended theater capacity is 375 seats, while 130 seats will be required for the planetarium.

- Application of typical planning factors reveals a need for approximately 2,500 square feet of food service space (145 seats) and 1,500 square feet of merchandise sales space. A self-service cafe and one or more snack stands are envisioned as the food service offering, while a main gift shop and a satellite theater store are suggested for merchandise operations.

- Three ticketing options are recommended for the project—an exhibits-only ticket providing admission to the aquarium and technology exhibits, a theater-only ticket for the film presentation, and a combination ticket encompassing all featured attractions. The recommended price structure
(1992 dollars) for adult tickets is $9.75 for the exhibits-only option, $5.50 for the theater-only option, and $12.95 for the combination package.

- After adjusting for attendance mix, the probable distribution of visitors among the three ticketing options, and an allowance for discounts, weighted average admissions revenue comes to $7.17 per capita. Average visitor expenditures on food and beverages are estimated at 80 cents per capita, with merchandise spending projected at $1.50 per capita. Overall visitor spending thus totals $9.47 per person.

- When multiplied by projected attendance volume, these per capita amounts translate into total gross visitor-related revenue of about $9.5 million as a mid-range projection. HPC has further assumed that Buffalo Harbor Center would organize a membership support group producing estimated annual dues of $450,000, while rentals of the facility for special after-hours events would contribute another $200,000 in revenue. Both of the latter are very conservative goals in light of what has been achieved at comparable attractions.

- Combined gross revenue from all sources accordingly totals a mid-range $10.1 million annually in constant 1992 dollars. Deducting the cost of food and merchandise goods sold from this total yields total net revenue of $9.2 million. It should be noted that this figure represents earned revenue only and does not consider possible donations and sponsorships arising from the private sector, nor does it make any allowance for grants, contributed services, and tax subsidies from the public sector.

- An annual operating budget of $8.1 million is estimated under the mid-range performance scenario. Adding this total to the cost of goods sold, total annual expenses will amount to $9.1 million, equivalent to 90 percent of the estimated $10.1 million in total gross earned revenue. An operating ratio of this description is consistent with experience at successful nonprofit attractions and should be a rational goal for Buffalo Harbor Center.
- For the initial-phase, mid-range scenario, therefore, a net operating income of slightly more than $1 million will be generated by the project. This sum represents the annual residual available for the reinvestment in facilities and programs that will be required on an ongoing basis to develop fresh program content and stimulate repeat visitation. It is thus evident that operation of Buffalo Harbor Center can be self-supporting given conformance to the basic assumptions employed in this analysis.

- The estimated total economic value of the project to the Buffalo region is approximately $172 million, or some two and one-half times the $68 million cost of first-phase development as estimated by design consultant Cambridge Seven Associates.

- During construction, Buffalo Harbor Center will directly generate 1,100 jobs and $37.5 million in payroll. Ongoing operations will produce an estimated 200 full-time equivalent jobs and a payroll of some $4.5 million annually. When multiplier effects are considered, the employment impact rises to 2,300 jobs during construction ($75 million payroll) and 400 jobs on an ongoing basis ($8.9 million payroll).

- Aggregate expenditures in the Niagara Frontier region for materials and supplies consumed in construction are projected at more than $32 million after taking into account multiplier effects, while the corresponding total for the operating period is in excess of $4 million annually.

- New visitor spending induced by the attraction, including on-site spending by attendees and off-site spending in area businesses by tourists coming to enjoy the attraction, is forecast at $29 million per year in combined direct and indirect impact.

- Aggregate direct and indirect tax revenues generated by the project, finally, are estimated at more than $2 million annually. This figure includes some $1.4 million per year in new sales tax revenue to be shared by the state of New York, various localities and school districts, and Erie County, along with approximately $600,000 accruing annually to Erie County in hotel/motel tax revenues.
• HPC's analysis has revealed that Buffalo Harbor Center will generate substantial economic benefits. As the attraction is expanded over time, these benefits will also grow. Equally significant, though not quantifiable, are the social benefits to be derived, including heightened community prestige resulting from the development of a high-quality destination attraction, augmentation of the local inventory of educational resources, provision of a means for increasing the appeal of downtown Buffalo to tourists and, most importantly, creation of a catalyst for the renaissance of a long-neglected and immensely valuable downtown waterfront.
Section 3
CONCEPT AND SITE EVALUATION

Major influences on the attendance potential of Buffalo Harbor Center are the general scope and content of the attraction--its "critical mass"--and the characteristics of the locational environment. To provide an overall context for the market and financial analysis to follow, therefore, this section of the report describes the background and identifies the basic objectives and envisioned components of the project. The downtown waterfront site environment is then evaluated from the standpoint of suitability for the type of development planned.

CONCEPT OF BUFFALO HARBOR CENTER

Subsequent paragraphs highlight the general conceptual parameters of the Buffalo Harbor Center project. It is recognized that the exact content of the program is still evolving and may ultimately differ in major or minor respects from the guidelines presented here.

Historical Background

Dependent as the nation is today on airports, railroads, and interstate highways, it is difficult to imagine the time when water was the principal--and often the only feasible--means of transporting goods and people from one place to another. The history of human settlement throughout North America, however, reveals the pivotal significance of coastal ports and inland waterways. Given the vast distance between the oceans flanking the continent, the latter became especially important as human migration, both Native and European, radiated outward from the initial coastal enclaves. It is no accident that locales such as what is now Buffalo, situated on the 10,000-square-mile inland "sea" of Lake Erie between two navigable rivers, first became frontier outposts and later major transshipment centers. In a tribute to the importance of waterways, Bufffalo's very name does not derive, as might be presumed, from the shaggy beast that so often symbolizes it, but from the French "beau fleuve," meaning "beautiful river," a name bestowed by early French explorers.
The Mohawks, Hurons, Algonquins, and many other Native American tribes inhabited the forests of the Great Lakes region for thousands of years before the European "discovery" of North America until, early in the 14th century, the great Iroquois Confederation united most of these tribes in a powerful alliance. This alliance persisted until well after the European arrival and gave rise to a thriving trade in furs with the French and others. Buffalo's beginnings as a fur-trading post supported a modest settlement, which eventually grew to major commercial port status with completion of the Erie Canal in 1825. The Canal's western terminus at Buffalo greatly accelerated industrial and population growth in the area as the city became the largest grain port in the world, moving enormous quantities of wheat and flour from Midwestern farms and mills to New York City and other points on the East Coast.

It was a complementary technological invention, however, that catapulted Buffalo into the major industrial city it is today. Significant as Buffalo was to the grain trade, the city was nevertheless the bottleneck on the route between farm and consumer market because the ships used on the Great Lakes were too big for the Erie Canal. The lake ships had to unload in Buffalo, where smaller canal boats took on the cargo--laboriously transferred by shovel and basket--to move it farther eastward. The problem became increasingly more acute as the volume of grain movements grew. Then, in 1842, Buffalo businessman Joseph Dart invented the grain elevator, a mechanical means of transferring grain, faster and in greater quantities, to the smaller canal vessels. The grain elevator and its modern variants, today a familiar landmark in agricultural centers and ports around the world, is recognized as one of the most significant innovations in industrial technology.

Thrust into major inland port status by the Erie Canal and the grain elevator, Buffalo soon began to attract other major industries, notably iron and steel production, which provided the impetus for still more manufacturing enterprises. By the turn of the 19th century, Buffalo had become a major U.S. city, reflected by its hosting, in 1901, of the Pan-American Exposition (staged in what is now Delaware Park), which attracted celebrities and exotic exhibits from around the world. The event, however, is unfortunately best remembered as the occasion of the assassination of President William McKinley, who was shot while attending a reception for dignitaries attending the fair. Vice President Theodore Roosevelt, at the time vacationing in the Adirondacks, was summoned to Buffalo and sworn in as the nation's twenty-sixth president in a friend's mansion--now a National Historic Landmark.
During World Wars I and II, Buffalo assumed strategic importance to the war effort due to its by-then enormous industrial production, much of which stemmed from the hydroelectric power generation of nearby Niagara Falls. The Falls, meanwhile, were by now a world-famous tourist destination and favorite honeymoon site. At about the same time, Buffalo also became one of the largest railroad centers in the eastern United States. Heavy industry continued to grow—the Pierce-Arrow automobile was produced entirely in Buffalo, as were all of the Curtiss Wright airplanes manufactured during the Second World War. The year 1955 saw the debut of the Buffalo Skyway, the first fixed-span highway bridge to be built over the Inner Harbor, which permitted traffic to bypass downtown Buffalo on its way north or south—an efficient highway improvement but, ultimately, an effective barrier to public access to the waterfront. Completion of the St. Lawrence Seaway in 1959, which afforded an alternate route between the Great Lakes and the Atlantic Ocean, diverted traffic from the Erie Canal and, hence, the port of Buffalo.

During the 1960s, Buffalo fell on hard times. The grain trade had slowed to a trickle and demand for its heavy industrial products faced intensified international competition; there were no viable alternatives to take up the slack. The waterfront, in particular, went into serious decline at this time, with grain elevators largely defunct and major factories shutting down. Support businesses followed suit or relocated elsewhere. The economic decline was exacerbated by the fact that during the city's industrial heyday, Lake Erie had been used as a dumping ground for agricultural and industrial waste, much of it toxic, which prevented immediate redevelopment of the waterfront for alternative land uses and, given the long-term effects of such pollution, still inhibits redevelopment of certain stretches of shoreline.

New York's second-largest city is today on the verge of rebirth. Growth in the service and retail sectors of the economy, largely supported by tourism, has offset much of the industrial loss. In fact, a retail boom of sorts is taking place with establishment of the bilateral Free Trade Agreement between the US. and Canada. Given the ease of international access across the border at Niagara Falls, Buffalo has become a major trading center, with Canadians flocking over to take advantage of lower-priced and lower-taxed consumer goods. Meanwhile, on the downtown waterfront, completion of Erie Basin Marina in the mid-70s provided a beachhead, both literally and figuratively, for restoration of public access. Introduction of the Miss Buffalo excursion boat
operation (1972) and development of the Naval and Servicemen's Park (1978) further enhanced recreational use of the harbor area.

Development Objectives

Given the foregoing historical perspective, the Action Plan for the Buffalo waterfront zone sets forth several key conceptual objectives for the Buffalo Harbor Center attraction:

- That the theme be consistent with the historical traditions of western New York, and particularly Erie County and the city of Buffalo.
- That the complex encompass a broad array of cultural, educational, scientific, and recreational activities that will have broad appeal to local residents and to tourists.
- That the project complement and synergize with other attractions in central Buffalo.
- That the attraction showcase the past, present, and future of the Buffalo region in a manner that is both entertaining and enlightening.

Embedded in these objectives is the fundamental thrust of the project, namely to give the downtown harbor area a new, "user-friendly" image that will spur dramatically increased public enjoyment of and pride in this outstanding natural asset. To this end, the attraction will establish working relationships with various cultural, historical, environmental, and educational groups both within Buffalo and throughout the Great Lakes region to ensure accuracy and sensitivity in its presentations.

Principal Facility Components

A number of closely related facilities would comprise Buffalo Harbor Center. Based on conceptual plans developed by Cambridge Seven Associates, these facilities are listed in Table 1. An overall theme of "Nature and Technology" is proposed, which draws together the story of Buffalo's urban development over the years and the unique natural environment in which these events took place. The interface and connections
Table 1

PROGRAM CONCEPT FOR BUFFALO HARBOR CENTER

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<td>• Birch Bark Canoes</td>
</tr>
<tr>
<td></td>
<td>• The Fur Trade</td>
</tr>
<tr>
<td>Gulf of St. Lawrence</td>
<td>Major aquarium presentation of pelagic marine life found in the Gulf of St. Lawrence.</td>
</tr>
<tr>
<td></td>
<td>Illustrative focal attractions:</td>
</tr>
<tr>
<td></td>
<td>• Deep Gulf, Open Saltwater Tank with Beluga Whales</td>
</tr>
<tr>
<td></td>
<td>• Rocky Shore of the Strait of Belle Isle with Harp Seals and Hooded Seals</td>
</tr>
<tr>
<td></td>
<td>Illustrative interpretive exhibits:</td>
</tr>
<tr>
<td></td>
<td>• Water Management in the Great Lakes System</td>
</tr>
<tr>
<td></td>
<td>• Marine Mammal Migrations</td>
</tr>
<tr>
<td>Great Lakes of the World</td>
<td>Series of exhibits contrasting the temperate-zone North American Great Lakes with other major lakes in arctic and tropical climatic zones.</td>
</tr>
</tbody>
</table>
Table 1
(Continued)

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illustrative focal attractions:</td>
<td></td>
</tr>
<tr>
<td>• Cliffs of Lake Baikal in Siberia with Baikal Seals</td>
<td></td>
</tr>
<tr>
<td>• Lake Malawi in Africa with a Colorful Array of Cichlids</td>
<td></td>
</tr>
<tr>
<td>• Lake Erie Before the Introduction of Nonnative Species and Pollutants</td>
<td>(Atlantic salmon, lake trout, sturgeon)</td>
</tr>
<tr>
<td>• Lake Erie Today (walleye, alewives, rainbow trout, coho salmon)</td>
<td></td>
</tr>
<tr>
<td>Illustrative interpretive exhibits:</td>
<td></td>
</tr>
<tr>
<td>• “Great Lakes” of the World</td>
<td></td>
</tr>
<tr>
<td>• Forming Lakes: Earthquakes and Glaciers</td>
<td></td>
</tr>
<tr>
<td>• Saltwater Lakes</td>
<td></td>
</tr>
<tr>
<td>• Alpine Lakes</td>
<td></td>
</tr>
<tr>
<td>• Introduced Species</td>
<td></td>
</tr>
</tbody>
</table>

TECHNOLOGY EXHIBITS
Buffalo Harbor 1890

Replica of a 19th century waterfront warehouse housing exhibits pertaining to the industrial and commercial development of Buffalo.

Illustrative focal artifacts:
• Canal Barge
• Trusses from Grain Steamer
• Large-Scale Model of Grain Elevator
• Buffalo Lightship
• Buffalo Rolling Diner

Illustrative interpretive exhibits:
• Building the Canals
• Lock Systems
• Ships on the Lakes and Canals
• Boat Construction
• Ship Restoration
• Engineering Grain Elevators
• Operation of Grain Elevators
• Operation of Locomotives
• Freight Cars Versus Canal Barges
Table 1

(Continued)

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Lakes Today</strong></td>
<td>Major exhibit devoted to modern industry on the waterfront and efforts to study and control pollution.</td>
</tr>
<tr>
<td></td>
<td>Illustrative interpretive exhibits:</td>
</tr>
<tr>
<td></td>
<td>• Changing Exhibits Concerning the Work of the Great Lakes Research Institute</td>
</tr>
<tr>
<td><strong>People of the Great Lakes</strong></td>
<td>Multimedia presentation of the historic and contemporary story of the people who settled in and developed Buffalo.</td>
</tr>
<tr>
<td></td>
<td>Illustrative focal attractions:</td>
</tr>
<tr>
<td></td>
<td>• Multimedia Theater Featuring Vignettes of Buffalo Residents, Past and Present</td>
</tr>
<tr>
<td></td>
<td>Illustrative interpretive exhibits:</td>
</tr>
<tr>
<td></td>
<td>• Ethnic Diversity of Buffalo and the Great Lakes</td>
</tr>
<tr>
<td></td>
<td>• Oral History Interactive Database</td>
</tr>
<tr>
<td><strong>LAKEWATCH CENTER</strong></td>
<td>Series of exhibits that explore the interrelationships of nature and technology and their implications for the future of the Great Lakes.</td>
</tr>
<tr>
<td></td>
<td>Illustrative permanent attractions:</td>
</tr>
<tr>
<td></td>
<td>• The Deep: Underwater Archaeology (exhibits focusing on shipwrecks in the Great Lakes and efforts to find and recover the vessels)</td>
</tr>
<tr>
<td></td>
<td>• The Elements: Great Lakes Weather Station (simulated weather station depicting means of monitoring weather in the Great Lakes region)</td>
</tr>
<tr>
<td></td>
<td>• Power on the Lakes: Interactive Simulation Platforms (participatory wind simulations for speed skiing, sailing and windsurfing)</td>
</tr>
<tr>
<td></td>
<td>• Our Fragile Planet--Beyond the Great Lakes: Planetarium (state-of-the-art planetarium)</td>
</tr>
<tr>
<td></td>
<td>• Learning About the Lakes: Children's Discovery Center (hands-on science exhibitry for young children)</td>
</tr>
<tr>
<td></td>
<td>• Great Lakes IMAX Theater (large-format film presentation)</td>
</tr>
</tbody>
</table>
### Table 1
(Continued)

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAVILIONS IN THE PARK</td>
<td>Ancillary facilities and attractions providing supplementary insight into the natural ecosystems and heritage of Buffalo and the Great Lakes.</td>
</tr>
<tr>
<td></td>
<td>Illustrative attractions:</td>
</tr>
<tr>
<td></td>
<td>• Great Lakes Research Institute</td>
</tr>
<tr>
<td></td>
<td>• Fishing Center and Fishing Pier</td>
</tr>
<tr>
<td></td>
<td>• Center for Wood Boat Design</td>
</tr>
<tr>
<td></td>
<td>• Nature Trails and Times Beach Nature Preserve</td>
</tr>
<tr>
<td></td>
<td>• Reception Area for Industrial Heritage Grain Elevator Tours</td>
</tr>
<tr>
<td></td>
<td>• Coast Guard Lighthouse</td>
</tr>
<tr>
<td></td>
<td>• Lighthouse Park</td>
</tr>
</tbody>
</table>
between the two parts of the broad ecosystem would be articulated in a series of exhibits, briefly described below:

- **NATURE EXHIBITS** would have three main clusters together forming a major aquarium/terrestrial habitat presentation. The first of these, **Native Americans and the Lakes** would depict the Great Lakes region prior to European settlement through a number of representative habitats, while pelagic marine life native to northern waters of the region would be featured in **Gulf of St. Lawrence**. Aquatic species found in the temperate-zone North American Great Lakes would be contrasted with those of other major lakes in arctic and tropical climatic zones in **Great Lakes of the World**.

- **TECHNOLOGY EXHIBITS** would similarly be organized into three groups, in this case constituting a major science and technology center. The industrial and commercial development of Buffalo and its waterfront would be expressed in **Buffalo Harbor 1890**, which will recall the golden days of the grain trade. Another section, **The Lakes Today**, would be devoted to modern industry on the waterfront and efforts to study and control pollution. The multifaceted story of human enterprise in the region would unfold in **Peoples of the Great Lakes**.

- **LAKEWATCH CENTER** would unite the "Nature and Technology" theme through a series of exhibits on topics such as underwater archaeology, weather monitoring, and power generation. Some of these exhibits would be permanent and others temporary to enable continuous updating of subject matter in concert with new scientific findings. Three key attractions would also be found in this part of the complex--the **Great Lakes IMAX Theater**, a large-format film presentation, a Planetarium offering sky shows, and a **Children's Discovery Center** offering hands-on science exhibitry for youngsters.

- **PAVILIONS IN THE PARK** would be the final component of the project and would encompass several ancillary operations that provide supplementary insight into the natural ecosystems and heritage of Buffalo and the Great Lakes. Included would be the Great Lakes
Research Institute, a Center for Wood Boat Design, the Times Beach Nature Preserve, and the historic Buffalo Lighthouse at the Coast Guard dock, among other facilities.

With the exception of PAVILIONS IN THE PARK, it is envisioned that all major facilities described above would be developed as a single structure. Greater operating efficiency is enabled in this manner, which will also maximize visitor comfort and convenience. PAVILIONS facilities, on the other hand, already are (Times Beach and the Buffalo Lighthouse) or would be independently located (such as the Great Lakes Research Institute) elsewhere in the harbor area depending on the site needs of governing agencies. Conceptual sketches and supporting documents prepared by Cambridge Seven provide a full description of the envisioned content of Buffalo Harbor Center, but the foregoing is representative of the basic design program. This analysis is not concerned with the independent PAVILIONS facilities. For the remaining attractions and activities, Buffalo Harbor Center should in the aggregate generate visitor stay times ranging from one to four hours, with the overall average estimated at approximately two hours.

EVALUATION OF THE SITE ENVIRONMENT

Location is a fundamental and critical ingredient in the success of any recreation attraction. Key locational characteristics of the Buffalo waterfront are consequently examined in subsequent paragraphs, including accessibility, existing inventory of complementary and competitive facilities, and weather conditions.

Locational Characteristics

As shown in Figure 1, Buffalo is situated in western New York at the extreme eastern tip of Lake Erie. It is approximately 375 miles northwest of New York City and 215 miles northeast of Pittsburgh. Toronto is found about 100 miles to the northwest. Principal highway access to the city is via Interstate 90 (New York Thruway), while air access is provided by Greater Buffalo International Airport, currently served by nine air carriers. The dominant feature of the area, of course, is Lake Erie--240 miles in length and 10 to 58 miles in width--slightly larger than the state of Vermont. While maximum depth of the lake is several hundred feet, mean depth is only 90 feet, which makes for turbulent conditions in heavy winds and contributes to Buffalo's characteristically
Figure 1
REGIONAL ORIENTATION MAP
rigorous winters. Lake Erie drains, via the Niagara River and the great cataract of Niagara Falls, into Lake Ontario. The Buffalo River is located just to the south of the downtown area and, together with the Outer Harbor on the lake and several manmade canals, forms part of the central port complex.

Figure 2 delineates the 90-mile waterfront zone covered by the Action Plan now being implemented by Horizons Waterfront Commission. For planning purposes, the zone has been divided into three sectors, with the downtown Buffalo waterfront under study in this analysis being located in the central sector. It should be noted that, as of this writing, no specific site within the downtown harbor area has been designated for the subject attraction. There are several options; HPC understands that Ehrenkrantz & Eckstut Architects, planning consultant for the overall waterfront zone, favors a location on the city shore of the Inner Harbor (as opposed to the Outer Harbor) for several reasons, including the availability of existing infrastructural support, ease of access, and potential linkages with other recreational facilities existing or contemplated for the same vicinity.

In evaluating tradeoffs between identified alternatives, an Outer Harbor location would offer the superb ambiance of frontage directly on Lake Erie, a more easily secured environment, and the ability to create a visible and distinctive recreational destination on a heretofore nearly barren stretch of waterfront. Conversely, it also has the significant disadvantage of limited accessibility given the barrier between downtown and the Outer Harbor represented by the Skyway and rail lines. The concomitant need to develop a practical surface route bridging the waters between downtown and the Outer Harbor is recognizably a costly undertaking that may divert funds from other developments proposed. A city-side location, on the other hand, affords excellent access (as well as existing parking infrastructure), not only by road, but by the downtown light rail public transportation system, which terminates at the foot of Main Street on the Inner Harbor. It is also convenient to downtown hotels catering to tourist and convention trade, thus enhancing exposure to this key market segment.

Given due attention to the buffering of the subject attraction from possibly conflicting land uses and potential security problems on the downtown side, HPC has no serious disagreement with an Inner Harbor site. Landscaped berms surrounding the Buffalo Harbor Center project and security fencing, as dictated by the need to protect animal life and valuable artifacts to be displayed at the attraction, would accomplish this aim.
Figure 2
BUFFALO WATERFRONT DEVELOPMENT ZONE
The Outer Harbor, meanwhile, will remain suitable for ancillary facilities included within the overall development concept--Times Beach and the Buffalo Lighthouse already present, plus other low-density, park-like uses.

Weather Conditions

Weather characteristics of the Buffalo region will have an impact on the performance of Buffalo Harbor Center to the extent that they influence the pattern of recreation use of the waterfront and are particularly important in the context of their effect on the seasonal distribution of tourist visitation to the area. In Table 2, temperature and precipitation norms for Buffalo are indicated. Average maximum temperature, as shown, ranges from a low of about 30 degrees in January to a high of 80 degrees in July, while average (nighttime) minimums vary from less than 18 degrees in winter to the moderate low-60s in summer. Amenable summer evening temperatures in Buffalo contrast favorably with the sultry heat of much of the Midwest and Mid-Atlantic regions. The table also shows that Buffalo records some 36 inches of rain and 90 inches of snow or ice annually. Wind speed, averaging some 12 miles per hour on an annual basis, shows a seasonal variation reaching a peak during winter at more than 14 miles per hour--an average that incorporates blustery days of substantially higher windspeeds which, in tandem with low air temperatures, contribute to an appreciable wind chill factor.

Buffalo weather conditions are compared with those of other selected metropolitan areas in Table 3. As an inland site removed from the tempering effects of marine air movements, it is not surprising to find that Buffalo's climate is relatively more severe than the coastal cities indicated in the table. All factors considered, Buffalo compares rather closely with Chicago, another inland Great Lakes location, although Buffalo's winters nevertheless tend to be more severe. As will be discussed subsequently in this report, weather conditions have an obvious effect on the seasonality of tourist visitation to the area. Additionally, weather has certain implications on the physical design of Buffalo Harbor Center, which must furnish adequate protection from the elements to enable year-round operation.
<table>
<thead>
<tr>
<th>Month</th>
<th>Temperature (°F)</th>
<th>Precipitation (inches)</th>
<th>Average Wind Speed (mph)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Maximum</td>
<td>Average Minimum</td>
<td>Rain</td>
</tr>
<tr>
<td>January</td>
<td>29.8</td>
<td>17.6</td>
<td>2.9</td>
</tr>
<tr>
<td>February</td>
<td>31.0</td>
<td>17.7</td>
<td>2.6</td>
</tr>
<tr>
<td>March</td>
<td>39.0</td>
<td>25.2</td>
<td>2.9</td>
</tr>
<tr>
<td>April</td>
<td>53.3</td>
<td>36.4</td>
<td>3.2</td>
</tr>
<tr>
<td>May</td>
<td>64.3</td>
<td>45.9</td>
<td>3.0</td>
</tr>
<tr>
<td>June</td>
<td>75.1</td>
<td>56.3</td>
<td>2.2</td>
</tr>
<tr>
<td>July</td>
<td>79.5</td>
<td>60.7</td>
<td>2.9</td>
</tr>
<tr>
<td>August</td>
<td>77.6</td>
<td>59.1</td>
<td>3.5</td>
</tr>
<tr>
<td>September</td>
<td>70.8</td>
<td>52.3</td>
<td>3.3</td>
</tr>
<tr>
<td>October</td>
<td>60.2</td>
<td>42.7</td>
<td>3.0</td>
</tr>
<tr>
<td>November</td>
<td>46.1</td>
<td>33.5</td>
<td>3.7</td>
</tr>
<tr>
<td>December</td>
<td>33.6</td>
<td>22.2</td>
<td>3.0</td>
</tr>
<tr>
<td>Annual</td>
<td>55.0</td>
<td>39.1</td>
<td>36.2</td>
</tr>
</tbody>
</table>

T means trace.

Source: National Oceanic and Atmospheric Administration.
### Table 3

**COMPARATIVE WEATHER CHARACTERISTICS**

**FOR SELECTED U.S. METRO AREAS**

(30-Year Averages)

<table>
<thead>
<tr>
<th></th>
<th>Buffalo</th>
<th>New York</th>
<th>Chicago</th>
<th>Boston</th>
<th>Baltimore</th>
<th>Seattle</th>
<th>New Orleans</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature (°F)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Annual Maximum</td>
<td>55</td>
<td>62</td>
<td>59</td>
<td>59</td>
<td>65</td>
<td>60</td>
<td>78</td>
</tr>
<tr>
<td>Average Annual Minimum</td>
<td>39</td>
<td>47</td>
<td>42</td>
<td>44</td>
<td>45</td>
<td>45</td>
<td>59</td>
</tr>
<tr>
<td>Range of Summer Maximum</td>
<td>75-80</td>
<td>81-85</td>
<td>81-84</td>
<td>77-81</td>
<td>83-87</td>
<td>70-76</td>
<td>90-91</td>
</tr>
<tr>
<td>Record High</td>
<td>99</td>
<td>106</td>
<td>104</td>
<td>102</td>
<td>102</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Record Low</td>
<td>-20</td>
<td>-15</td>
<td>-16</td>
<td>-12</td>
<td>-7</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td><strong>Precipitation (inches)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Annual Rainfall</td>
<td>36</td>
<td>40</td>
<td>34</td>
<td>43</td>
<td>40</td>
<td>36</td>
<td>57</td>
</tr>
<tr>
<td>Average Annual Snowfall</td>
<td>90</td>
<td>29</td>
<td>40</td>
<td>42</td>
<td>22</td>
<td>9</td>
<td>T</td>
</tr>
<tr>
<td>Mean Number of Days With</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;0.01 Inches</td>
<td>167</td>
<td>121</td>
<td>125</td>
<td>129</td>
<td>113</td>
<td>153</td>
<td>114</td>
</tr>
<tr>
<td>Mean Annual Windspeed (mph)</td>
<td>12.3</td>
<td>9.4</td>
<td>10.4</td>
<td>12.6</td>
<td>9.5</td>
<td>9.3</td>
<td>8.4</td>
</tr>
</tbody>
</table>

T means trace.

Source: National Oceanic and Atmospheric Administration.
Local Attractions Inventory

Leisure-oriented attractions in the Buffalo area encompass, first and foremost, the scenic wonder of Niagara Falls, plus several historical sites, many commercial entertainment facilities, sightseeing excursions, and a variety of museums and other cultural opportunities. A partial listing of this extensive existing inventory is presented in Table 4. As indicated, attendance volume ranges up to a high of more than 1 million at Darien Lake Theme Park and the Maid of the Mist boat ride, followed by several other Falls-related attractions, plus the Buffalo Zoo, reporting upwards of 500,000. Most other facilities listed are concentrated in the 200,000 to 400,000 range. As this partial inventory suggests, there is an abundance of major and minor recreation opportunities in the Buffalo-Niagara Falls area, most of them concentrated in the primary tourist destination of Niagara Falls, New York/Ontario. By and large, the better quality facilities are located on the Canadian side of the Falls. This observation does not necessarily mean that there is untapped potential on the U.S. side of the border or in Buffalo specifically—the Canadian and American markets are in fact a single universe in which U.S. attractions compete with Canadian attractions for the same customers. Competition for the visitor’s time and money is intense, particularly when it is recognized that all of the commercial and cultural operations compete with the free attraction of seeing the Falls—the prime motivation for travel to the area.

Proposed major additions to the existing inventory on the Canadian side include “Maharishi Veda Land,” reportedly a $1.5 billion theme park to be developed on 1,400 acres along the Welland River about two miles from the Falls. Well-known magician Doug Henning is the principal developer of this park, the preliminary concept for which calls for some 30 rides and exhibits that will symbolically take visitors through the realm of transcendental meditation popularized by the Maharishi Mahesh Yogi. Attendance forecasts for this attraction call for 5 to 6 million visitors annually. The current status of this venture is unknown; however, as a commercial enterprise with an estimated entry fee of at least $21 per day in current dollars (three days being envisioned for the complete experience), Veda Land appears to represent an extraordinary risk in the highly competitive Niagara Falls-Buffalo marketplace.

Figure 3 shows the location of existing cultural/educational attractions in Buffalo proper relative to the subject site area. Four major attractions are found in Delaware Park (the former Pan-American Exposition grounds) at the north edge of downtown—
### Table 4

**PARTIAL INVENTORY OF EXISTING ATTRACTIONS**

**IN THE BUFFALO-NIAGARA FALLS AREA**

*1992*

<table>
<thead>
<tr>
<th>Attraction</th>
<th>Operating Season</th>
<th>Adult Admission Price 1/</th>
<th>Current Annual Attendance (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Buffalo Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Darien Lake Theme Park</td>
<td>Mem Day-Lab Day</td>
<td>$15.95</td>
<td>1,144</td>
</tr>
<tr>
<td>Buffalo Zoological Gardens</td>
<td>All year</td>
<td>3.00</td>
<td>506</td>
</tr>
<tr>
<td>Albright-Knox Art Gallery</td>
<td>All year</td>
<td>Free</td>
<td>220</td>
</tr>
<tr>
<td>Buffalo Museum of Science</td>
<td>All year</td>
<td>2.50</td>
<td>129</td>
</tr>
<tr>
<td>Buffalo &amp; Erie County Botanical Gardens</td>
<td>All year</td>
<td>Free</td>
<td>100</td>
</tr>
<tr>
<td>Buffalo &amp; Erie County Naval &amp; Servicemen's Park</td>
<td>Apr-Nov</td>
<td>6.00</td>
<td>66</td>
</tr>
<tr>
<td>Theodore Roosevelt Inaugural Historic Site</td>
<td>All year</td>
<td>2.00</td>
<td>54</td>
</tr>
<tr>
<td>Burchfield Art Center</td>
<td>All year</td>
<td>Free</td>
<td>50</td>
</tr>
<tr>
<td>Buffalo-Erie County Historical Society Museum</td>
<td>All year</td>
<td>2.50</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Niagara Falls (New York) Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prospect Point Observation Tower</td>
<td>All year</td>
<td>$0.25</td>
<td>893</td>
</tr>
<tr>
<td>Fantasy Island Theme Park</td>
<td>Mem Day-Lab Day</td>
<td>15.95</td>
<td>n/a</td>
</tr>
<tr>
<td>Aquarium of Niagara Falls</td>
<td>All year</td>
<td>6.00</td>
<td>450</td>
</tr>
<tr>
<td>Cave of the Winds</td>
<td>May-Oct</td>
<td>4.00</td>
<td>245</td>
</tr>
<tr>
<td>Schoellkopf Geological Museum</td>
<td>All year</td>
<td>0.50</td>
<td>n/a</td>
</tr>
<tr>
<td>Native American Center for the Living Arts</td>
<td>All year</td>
<td>3.50</td>
<td>30</td>
</tr>
<tr>
<td><strong>Niagara Falls (Ontario) Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maid of the Mist Boat Ride/Incline Railway</td>
<td>May-Oct</td>
<td>$7.00</td>
<td>1,046</td>
</tr>
<tr>
<td>Table Rock Scenic Tunnels</td>
<td>All year</td>
<td>5.00</td>
<td>909</td>
</tr>
<tr>
<td>Falls Incline Railway</td>
<td>May-Oct</td>
<td>1.00</td>
<td>800</td>
</tr>
<tr>
<td>Marineland</td>
<td>All year</td>
<td>16.95</td>
<td>n/a</td>
</tr>
<tr>
<td>Niagara Falls IMAX Theater</td>
<td>All year</td>
<td>7.50</td>
<td>650</td>
</tr>
<tr>
<td>Maple Leaf Village Amusement Park</td>
<td>May-Oct</td>
<td>12.95</td>
<td>605</td>
</tr>
<tr>
<td>Queen Victoria Park Greenhouse</td>
<td>All year</td>
<td>Free</td>
<td>368</td>
</tr>
<tr>
<td>Niagara Spanish Aerocar</td>
<td>Mem Day-Lab Day</td>
<td>4.25</td>
<td>205</td>
</tr>
<tr>
<td>Guinness World of Records Museum</td>
<td>All year</td>
<td>5.45</td>
<td>170</td>
</tr>
<tr>
<td>Great Gorge Adventure</td>
<td>May-Oct</td>
<td>4.00</td>
<td>113</td>
</tr>
</tbody>
</table>

n/a means not available.

1/ Admission fees for Canadian attractions are in Canadian dollars.

Source: Harrison Price Company.
Figure 3

PRINCIPAL EXISTING ATTRACTIONS
IN CENTRAL BUFFALO
the Burchfield Art Center, the Albright-Knox Art Gallery, the Buffalo-Erie County Historical Society museum, and the Buffalo Zoo. The Buffalo Science Center is found on the east side of the downtown area in Martin Luther King Park, while the Roosevelt Inaugural Historic site and the Theater District (an assemblage of several independent performing arts facilities) are centrally located. The sole existing major attraction of this type on the downtown waterfront is the Naval & Servicemen's Park with its array of military ships and maritime exhibits. Given the objective of increasing public access to the waterfront, Buffalo Harbor Center will complement the existing inventory of cultural attractions and can be expected to have a synergistic impact. There are significant opportunities, moreover, for the involvement of these fine institutions in exhibits and special events to be developed at the subject attraction and, hence, joint promotion to mutual benefit.
Section 4
MARKET SUPPORT ANALYSIS

An examination of the magnitude and quality of available market support is a necessary prerequisite to a determination of attendance volume at Buffalo Harbor Center. The two components of the market available to the project are the regional resident population and the nonresident tourist population, the size and characteristics of which are analyzed in this section of the report.

AVAILABLE RESIDENT MARKET

In the recreation industry, a standard definition of the effective resident market for a major attraction is a 50-mile radius of the site, or up to 90 minutes in driving time given typical urban traffic conditions, with attendees originating beyond this limit classed as tourists (including excursionists within a day's drive and long-distance travelers usually remaining overnight or longer). This definition, while somewhat arbitrary, has been utilized in this analysis. Because industry experience not surprisingly reveals a strong inverse relationship between propensity to attend and travel distance, this market has been further subdivided into two parts: a local, or primary, market extending up to about 25 miles, and a regional, or secondary, market comprising the balance of the 50-mile area.

The paragraphs to follow describe the principal characteristics of the resident market as just defined. Key demographic factors evaluated include population, age and income characteristics and, as an important subset of the market, school enrollment.

Population

Regional resident population within 50 miles of downtown Buffalo, an area embracing Erie, Niagara, Orleans, Genesee, Wyoming, and parts of Cattaraugus and Chautauqua counties in New York plus the St. Catharines-Niagara area of Ontario, amounted to some 1.8 million as of the 1990 Census, as shown in Table 5, a slight decrease from the 1980 count. Projections through 2005 reveal that this population base is expected to remain essentially stable. The primary market (0-25 miles), which
Table 5

POPULATION TRENDS IN THE
BUFFALO RESIDENT MARKET AREA
1980-2005

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Market (0-25 miles)</td>
<td>1,199</td>
<td>1,151</td>
<td>1,125</td>
<td>1,136</td>
<td>1,141</td>
</tr>
<tr>
<td>Secondary Market (25-50 miles)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>286</td>
<td>287</td>
<td>286</td>
<td>290</td>
<td>292</td>
</tr>
<tr>
<td>Canada 1/</td>
<td>343</td>
<td>345</td>
<td>346</td>
<td>348</td>
<td>350</td>
</tr>
<tr>
<td>Subtotal</td>
<td>629</td>
<td>632</td>
<td>632</td>
<td>638</td>
<td>642</td>
</tr>
<tr>
<td>Total</td>
<td>1,828</td>
<td>1,783</td>
<td>1,757</td>
<td>1,774</td>
<td>1,783</td>
</tr>
</tbody>
</table>

1/ Includes the St. Catharines-Niagara Census area.

extends through Erie County and most of Niagara County, contains roughly 1.2 million residents currently. A modest population of approximately 630,000 is found in the secondary market (25-50 miles), a segment which encompasses low-density suburbs on the fringe of metropolitan Buffalo as well as considerable water area in Lake Erie and Lake Ontario.

**Income and Age Characteristics**

A current income profile for the resident market is presented in Table 6. Overall median income, as shown, amounted to slightly more than $29,000 annually as of 1990, with no appreciable difference (only about 3 percent) between the primary and secondary segments. It should be noted that these data exclude the Canadian portions of the 50-mile radius, for which comparable data are unavailable (Canada's most recent Census was conducted in 1991 and results have not yet been published). Age characteristics, set forth in Table 7, reveal a current overall median of 35 years, with the primary market marginally older on average (median of 35.4 years) than the secondary market (median of 33.7 years). Again, Canadians are excluded from these averages.

Comparative data for other U.S. cities is presented in Table 8. The cities selected for this comparison are those with existing major aquariums as a means of assessing the relative quality of available market support for this kind of attraction (data shown for Buffalo in this table pertain to the metropolitan area and differ from figures shown in Tables 6 and 7, which refer to a 50-mile radius). Incomes in metropolitan Buffalo, as indicated, are equal to the national average, although below several of the other cities listed. Median age in Buffalo, meanwhile, is somewhat higher than any of the other areas. The market may hence be described as comparatively mature and moderately affluent--while it may not be exceptional, Buffalo is nevertheless a solid market that exhibits no serious weakness in qualitative terms.

**School Enrollment**

It is the expressed aim of the Buffalo Harbor Center project to develop a strong educational program and encourage field trips from area schools. A key submarket, accordingly, is school district enrollment within a reasonable busing distance of the downtown harbor. School authorities state that 25 to 30 miles is the preferred
Table 6

INCOME CHARACTERISTICS OF THE BUFFALO RESIDENT MARKET AREA
1990

<table>
<thead>
<tr>
<th>Resident Market Segment</th>
<th>Primary (0-25 miles)</th>
<th>Secondary (25-50 miles)</th>
<th>Total 1/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Households (thousands)</td>
<td>449</td>
<td>101</td>
<td>550</td>
</tr>
<tr>
<td>Percent Distribution by Income Category:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Than $15,000</td>
<td>25.7%</td>
<td>24.5%</td>
<td>25.4%</td>
</tr>
<tr>
<td>$15,000-$24,999</td>
<td>17.3</td>
<td>19.5</td>
<td>17.6</td>
</tr>
<tr>
<td>$25,000-$34,999</td>
<td>16.0</td>
<td>17.7</td>
<td>16.2</td>
</tr>
<tr>
<td>$35,000-$49,999</td>
<td>19.2</td>
<td>19.4</td>
<td>19.3</td>
</tr>
<tr>
<td>$50,000-$74,999</td>
<td>15.2</td>
<td>14.1</td>
<td>15.1</td>
</tr>
<tr>
<td>$75,000 or More</td>
<td>6.6</td>
<td>4.8</td>
<td>6.3</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>$29,352</td>
<td>$28,397</td>
<td>$29,163</td>
</tr>
</tbody>
</table>

1/ Excludes the Canadian portion of the secondary market area, for which comparable data are unavailable.

Table 7

AGE CHARACTERISTICS OF THE BUFFALO RESIDENT MARKET AREA 1990

<table>
<thead>
<tr>
<th>Resident Market Segment</th>
<th>Primary (0-25 miles)</th>
<th>Secondary (25-50 miles)</th>
<th>Total 1/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population (thousands)</td>
<td>1,151</td>
<td>287</td>
<td>1,438</td>
</tr>
<tr>
<td>Percent Distribution by Age Group:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less Than 14 Years</td>
<td>18.5%</td>
<td>21.5%</td>
<td>19.1%</td>
</tr>
<tr>
<td>14-20 Years</td>
<td>9.7</td>
<td>9.9</td>
<td>9.8</td>
</tr>
<tr>
<td>21-34 Years</td>
<td>21.3</td>
<td>20.8</td>
<td>21.3</td>
</tr>
<tr>
<td>35-54 Years</td>
<td>24.4</td>
<td>24.9</td>
<td>24.5</td>
</tr>
<tr>
<td>55 Years or More</td>
<td>26.0</td>
<td>22.9</td>
<td>25.4</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Median Age (years)</td>
<td>35.4</td>
<td>33.7</td>
<td>35.0</td>
</tr>
</tbody>
</table>

1/ Excludes the Canadian portion of the secondary market area, for which comparable data are unavailable.

Table 8

COMPARATIVE INCOME AND AGE CHARACTERISTICS OF SELECTED U.S. METRO AREAS

1990

<table>
<thead>
<tr>
<th>Metro Area</th>
<th>Median Age (years)</th>
<th>Median Household Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston, MA</td>
<td>33.6</td>
<td>$36,445</td>
</tr>
<tr>
<td>Seattle, WA</td>
<td>33.4</td>
<td>36,423</td>
</tr>
<tr>
<td>Chicago, IL</td>
<td>32.7</td>
<td>33,927</td>
</tr>
<tr>
<td>Baltimore, MD</td>
<td>33.4</td>
<td>33,440</td>
</tr>
<tr>
<td>Philadelphia, PA</td>
<td>33.8</td>
<td>33,277</td>
</tr>
<tr>
<td>Monterey, CA</td>
<td>29.8</td>
<td>31,878</td>
</tr>
<tr>
<td>New York, NY</td>
<td>34.1</td>
<td>27,895</td>
</tr>
<tr>
<td>BUFFALO-NIAGARA FALLS, NY</td>
<td>34.8</td>
<td>27,863</td>
</tr>
<tr>
<td>New Orleans, LA</td>
<td>31.8</td>
<td>25,409</td>
</tr>
<tr>
<td>Chattanooga, TN</td>
<td>34.6</td>
<td>23,760</td>
</tr>
<tr>
<td>U.S. Average</td>
<td>33.1</td>
<td>$27,912</td>
</tr>
</tbody>
</table>

1/ Figures refer to metropolitan area and thus differ from those in Tables 6 and 7, which refer to a 50-mile radius.

maximum driving range given time limitations on school bus usage for field trips, which generally must be completed between 10 am and 2 pm when buses are not engaged in routine home-school transport. Some districts have extra buses and are not necessarily subject to this time constraint; in these instances, the mileage limit can be pushed to 50 or 60 miles, but this is the exception rather than the rule. For all practical purposes, then, the school market may be defined on roughly the same basis as the general resident market, or within about 25 miles as a primary draw and 25-50 miles as a secondary draw.

Enrollment data for the 1990-91 school year are contained in Table 9 (public schools) and Table 10 (private schools). As shown, some 170,000 children currently enrolled in Erie and Niagara County public schools comprise the primary market segment. Another 68,000 students are enrolled in secondary market area schools, for an aggregate public enrollment total of 238,000. Private school enrollment totals approximately 35,000 at the present time in the primary market area, while the secondary market area reports 39,000 private school students. Combined public and private enrollment, shown in Table 11, totals about 205,000 in the primary segment and 72,000 in the secondary segment, or some 277,000 for the 50-mile radius as a whole.

Although field trips do take place at all grade levels, the majority of such trips are concentrated at grades below the ninth year--once students have different teachers for different subjects as in high school, scheduling of field trips becomes logistically difficult. Recognizing this, educational programs at most cultural attractions are in fact deliberately targeted at lower and middle grades. Aggregate public and private enrollment in the Buffalo area for grades Kindergarten through 8, also indicated in Table 11, amounts to roughly 139,000 for the primary segment and another 51,000 in the secondary segment, for an overall market of approximately 190,000 students. The latter represents the core school population available to Buffalo Harbor Center.

AVAILABLE TOURIST MARKET

Endowed with the natural wonder of Niagara Falls, an impressive inventory of architectural treasures, numerous commercial attractions, and fine cultural institutions, the Niagara Frontier region is one of the nation's most popular tourist destinations.
### Table 9

**PUBLIC SCHOOL ENROLLMENT IN THE BUFFALO AREA**

**1990-91**

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Primary Market (0-25 miles)</th>
<th>Secondary Market (25-50 miles)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Erie County</td>
<td>Niagara County</td>
<td>Subtotal</td>
</tr>
<tr>
<td>Pre-K</td>
<td>2,306</td>
<td>132</td>
<td>2,438</td>
</tr>
<tr>
<td>K</td>
<td>10,721</td>
<td>2,770</td>
<td>13,491</td>
</tr>
<tr>
<td>1</td>
<td>11,417</td>
<td>2,984</td>
<td>14,401</td>
</tr>
<tr>
<td>2</td>
<td>10,582</td>
<td>2,622</td>
<td>13,204</td>
</tr>
<tr>
<td>3</td>
<td>10,322</td>
<td>2,665</td>
<td>12,987</td>
</tr>
<tr>
<td>4</td>
<td>9,939</td>
<td>2,655</td>
<td>12,594</td>
</tr>
<tr>
<td>5</td>
<td>9,799</td>
<td>2,675</td>
<td>12,474</td>
</tr>
<tr>
<td>6</td>
<td>9,533</td>
<td>2,599</td>
<td>12,132</td>
</tr>
<tr>
<td>7</td>
<td>9,537</td>
<td>2,562</td>
<td>12,099</td>
</tr>
<tr>
<td>8</td>
<td>9,169</td>
<td>2,469</td>
<td>11,638</td>
</tr>
<tr>
<td>9</td>
<td>9,604</td>
<td>2,655</td>
<td>12,259</td>
</tr>
<tr>
<td>10</td>
<td>9,296</td>
<td>2,515</td>
<td>11,811</td>
</tr>
<tr>
<td>11</td>
<td>9,025</td>
<td>2,296</td>
<td>11,321</td>
</tr>
<tr>
<td>12</td>
<td>8,878</td>
<td>2,361</td>
<td>11,239</td>
</tr>
<tr>
<td>Ungraded 1/</td>
<td>4,759</td>
<td>1,432</td>
<td>6,191</td>
</tr>
<tr>
<td>Total</td>
<td>134,887</td>
<td>35,392</td>
<td>170,279</td>
</tr>
</tbody>
</table>

1/ Includes students in special schools for the disabled, adults completing high school diploma requirements in night school, and other unassignable students.

Source: New York State Education Department and Harrison Price Company.
Table 10
PRIVATE SCHOOL ENROLLMENT IN THE BUFFALO AREA
1990-91

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Primary Market (0-25 miles)</th>
<th>Secondary Market (25-50 miles)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Erie County</td>
<td>Niagara County</td>
<td>Subtotal</td>
</tr>
<tr>
<td>Pre-K</td>
<td>2,826</td>
<td>482</td>
<td>3,308</td>
</tr>
<tr>
<td>K</td>
<td>2,849</td>
<td>450</td>
<td>3,299</td>
</tr>
<tr>
<td>1</td>
<td>2,589</td>
<td>422</td>
<td>3,011</td>
</tr>
<tr>
<td>2</td>
<td>2,368</td>
<td>361</td>
<td>2,729</td>
</tr>
<tr>
<td>3</td>
<td>2,472</td>
<td>386</td>
<td>2,858</td>
</tr>
<tr>
<td>4</td>
<td>2,304</td>
<td>340</td>
<td>2,644</td>
</tr>
<tr>
<td>5</td>
<td>2,220</td>
<td>347</td>
<td>2,567</td>
</tr>
<tr>
<td>6</td>
<td>2,079</td>
<td>307</td>
<td>2,386</td>
</tr>
<tr>
<td>7</td>
<td>1,914</td>
<td>279</td>
<td>2,193</td>
</tr>
<tr>
<td>8</td>
<td>1,892</td>
<td>219</td>
<td>2,111</td>
</tr>
<tr>
<td>9</td>
<td>1,691</td>
<td>72</td>
<td>1,763</td>
</tr>
<tr>
<td>10</td>
<td>1,609</td>
<td>49</td>
<td>1,658</td>
</tr>
<tr>
<td>11</td>
<td>1,489</td>
<td>44</td>
<td>1,533</td>
</tr>
<tr>
<td>12</td>
<td>1,532</td>
<td>52</td>
<td>1,584</td>
</tr>
<tr>
<td>Ungraded 1/</td>
<td>1,128</td>
<td>0</td>
<td>1,128</td>
</tr>
</tbody>
</table>

Total: 30,962 | 3,810 | 34,772 | 1,453 | 1,510 | 946 | 120 | 310 | 4,339 | 39,111

1/ Includes students in special schools for the disabled, adults completing high school diploma requirements in night school, and other unassignable students.

Source: New York State Education Department and Harrison Price Company.
### Table 11

**SUMMARY OF SCHOOL ENROLLMENT IN THE BUFFALO AREA**

**1990-91**

<table>
<thead>
<tr>
<th>County</th>
<th>Combined Public and Private School Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-K</td>
</tr>
<tr>
<td><strong>Primary Market (0-25 miles)</strong></td>
<td></td>
</tr>
<tr>
<td>Erie County</td>
<td>5,132</td>
</tr>
<tr>
<td>Niagara County</td>
<td>614</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>5,746</td>
</tr>
<tr>
<td><strong>Secondary Market (25-50 miles)</strong></td>
<td></td>
</tr>
<tr>
<td>Cattaraugus County</td>
<td>265</td>
</tr>
<tr>
<td>Chautauqua County</td>
<td>312</td>
</tr>
<tr>
<td>Genesee County</td>
<td>82</td>
</tr>
<tr>
<td>Orleans County</td>
<td>0</td>
</tr>
<tr>
<td>Wyoming County</td>
<td>35</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>694</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6,440</td>
</tr>
</tbody>
</table>

1/ Includes students in special schools for the disabled, adults completing high school diploma requirements in night school, and other unassignable students.

Source: Tables 9 and 10 and Harrison Price Company.
Subsequent paragraphs describe key aspects of the regional visitor industry, including estimated total volume and salient visitor characteristics.

**Estimated Market Size**

No official estimates of visitation to the Buffalo-Niagara Falls area are available. The widely reported range is 11 to 15 million, taking into account tourist traffic on both American and Canadian sides of the Falls. It is possible to test this estimate through an extrapolation from hotel capacity, which is presented in Table 12. As indicated, a total of some 14,600 hotel/motel rooms were available in the region as of 1990. Applying factors relative to average annual occupancy, number of persons per room, and mean length of hotel/motel stay as evidenced by various tourist surveys, the table calculates hotel-based visitation at approximately 4 million people. Data from the Greater Buffalo Convention and Visitors Bureau suggests that hotel visitors comprise slightly more than half of the overnight base, yielding a total overnight count (including visitors staying in other types of accommodations) on the order of 7.3 million people.

There is considerable uncertainty as to the size of the day-visit market—it is generally acknowledged as substantial, but surveys from different tourist agencies in the region report a wide variance, from as little as 11 percent of the overall market to as much as 28 percent. Visitor origin data, however, attest to the sizable number of arrivals from nearby points in western New York and a great many Canadians coming down from Toronto and adjacent sections of Ontario. Given the fact that most of these visitors can easily negotiate a day-trip, HPC suspects that a proportionately large day-visit market is the reality. Assuming that day-trippers account for about 28 percent of total tourist visitation, the magnitude of the overall market appears to be in the neighborhood of 10 million, as Table 12 concludes. This estimate may be conservative and is intended only as an order-of-magnitude figure viewed as reasonable for attendance planning purposes.

Review of long-term trends in travel to the Great Lakes region indicates sustained moderate growth in the neighborhood of 1 to 2 percent annually. Tourism in most areas of the United States has been on a downslope since 1989 given the persistent national recession, the Persian Gulf War, and other factors. There are signs that conditions are now improving, which should produce a turnaround in the recreational travel market this year and thereafter. Based on a conservative average annual
Table 12

ESTIMATION OF THE BUFFALO-NIAGARA FALLS TOURIST MARKET
1990

<table>
<thead>
<tr>
<th>Number of Hotel/Motel Rooms in Area 1/</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro Buffalo</td>
<td>4,500</td>
</tr>
<tr>
<td>Niagara Falls, NY</td>
<td>3,200</td>
</tr>
<tr>
<td>Niagara Falls, Ont</td>
<td>6,900</td>
</tr>
<tr>
<td>Total</td>
<td>14,600</td>
</tr>
</tbody>
</table>

| Average Annual Occupancy Rate       | 59% |
| Number of Occupied Rooms            | 8,614 |
| Annual Occupied Room-Nights (at 365 days) | 3,144,110 |
| Average Number of Persons Per Room  | 2.3 |
| Annual Person-Nights                | 7,231,453 |
| Average Hotel/Motel Length of Stay (nights) | 1.8 |
| Annual Number of Hotel/Motel Visitors | 4,017,474 |
| Hotel/Motel Visitors as Percent of Total Overnight Visitors | 55% |
| Annual Number of Overnight Visitors | 7,304,498 |

- Rounded to 7,300,000
- Overnight Visitors as Percent of Total 72%

| Total Annual Number of Visitors | 10,138,889 |
|                                | Rounded to 10,100,000 |

growth rate of about 1.5 percent per year, total visitation to the Niagara Frontier will reach about 12 million by 2000 and nearly 13 million by 2005. Most of the increase can be expected to occur in the overnight segment of the market since day-tripping is historically a slow-growth phenomenon associated with low rates of population gain in areas within a day's drive.

Visitor Characteristics

Table 13 highlights the findings of a 1988 U.S. Travel Data Center survey of domestic travelers to the Niagara Frontier region. With respect to main purpose of trip, Table 13 reveals that Buffalo, as might be expected, has a considerably greater business orientation than Niagara Falls--36 percent of total visitation as compared to Niagara's 6 percent. In keeping with the heavy business slant, travel party size is relatively small in Buffalo, averaging 1.6 persons--nearly 60 percent of all visitors to Buffalo are traveling alone and another one-third are couples. In contrast, 38 percent of all visitors to Niagara arrive in parties of three or more persons, suggesting relatively greater family appeal. Average visitor length of stay as reported in this survey totals about 1.7 nights, reflecting a large amount of day and weekend visitation. More than three-fourths of all tourists to Niagara Falls stay in commercial accommodations, whereas more than half of all tourists to Buffalo stay with friends and relatives, as would be consistent with the much larger population base of metropolitan Buffalo.

Findings of a more recent survey, undertaken in 1991 by the Buffalo Convention and Visitors Bureau, are presented in Table 14. The vast majority of all tourists, as indicated, arrive by automobile (93 percent), and most (77 percent) are destined to the Niagara Frontier region as opposed to passing through on their way elsewhere. Average length of stay is reported in this survey at 2.3 nights, with day visitation indicated at a relatively modest 11 percent of the total. Party size for this survey sample averaged 1.9 persons. Median age and income figures reveal a mature, affluent tourist market (48 years and $44,000 annual income). Average rates of spending in the area are substantial, amounting to $139 per person over the course of the trip, or more than $60 daily per person. Some 28 percent of all visitors are New York residents, with the province of Ontario contributing another 15 percent of the total. Pennsylvania, New Jersey, and Ohio follow in importance at 8 to 9 percent each.
Table 13

SELECTED CHARACTERISTICS OF DOMESTIC TRAVELERS TO BUFFALO AND NIAGARA FALLS 1988

<table>
<thead>
<tr>
<th>Percent of Total Respondents</th>
<th>Travelers to Buffalo Only</th>
<th>Travelers to Niagara Falls Only</th>
<th>Travelers to Both Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel Destination</td>
<td>24%</td>
<td>37%</td>
<td>39%</td>
</tr>
<tr>
<td>Main Purpose of Trip</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visit Friends/Relatives</td>
<td>39%</td>
<td>6%</td>
<td>n/a</td>
</tr>
<tr>
<td>Business/Convention</td>
<td>36</td>
<td>6</td>
<td>v</td>
</tr>
<tr>
<td>Entertainment/Outdoor Recr</td>
<td>19</td>
<td>77</td>
<td>v</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>11</td>
<td>v</td>
</tr>
<tr>
<td>Travel Party Size</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Person</td>
<td>57%</td>
<td>24%</td>
<td>n/a</td>
</tr>
<tr>
<td>Two Persons</td>
<td>33</td>
<td>38</td>
<td>v</td>
</tr>
<tr>
<td>Three Persons</td>
<td>4</td>
<td>12</td>
<td>v</td>
</tr>
<tr>
<td>Four or More Persons</td>
<td>6</td>
<td>26</td>
<td>v</td>
</tr>
<tr>
<td>Average (persons)</td>
<td>1.59</td>
<td>2.40</td>
<td>n/a</td>
</tr>
<tr>
<td>Length of Stay in Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day Only</td>
<td>---------------------------</td>
<td>18%</td>
<td>-------------------------</td>
</tr>
<tr>
<td>One Night</td>
<td>---------------------------</td>
<td>40%</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Two or Three Nights</td>
<td>---------------------------</td>
<td>28%</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Four or More Nights</td>
<td>---------------------------</td>
<td>14%</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Average (nights)</td>
<td>---------------------------</td>
<td>1.66</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Accommodations Used</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hotel/Motel</td>
<td>46%</td>
<td>78%</td>
<td>n/a</td>
</tr>
<tr>
<td>Homes of Friends/Relatives</td>
<td>52</td>
<td>17</td>
<td>v</td>
</tr>
<tr>
<td>Campground</td>
<td>2</td>
<td>3</td>
<td>v</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>2</td>
<td>v</td>
</tr>
</tbody>
</table>

n/a means not available.

1/ Based on a survey of 136 American households who traveled to Buffalo and/or Niagara Falls during 1988, conducted by the U.S. Travel Data Center and EL Associates.

Source: Greater Buffalo Convention and Visitors Bureau and Harrison Price Company.
Table 14

SELECTED CHARACTERISTICS OF TOURISTS TO THE NIAGARA FRONTIER REGION 1991

<table>
<thead>
<tr>
<th>Percent of Total Respondents 1/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of Arrival</td>
</tr>
<tr>
<td>Auto</td>
</tr>
<tr>
<td>Air</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Niagara Frontier Region</td>
</tr>
</tbody>
</table>
| Passing Through Enroute to Other Destinations | 23%

<table>
<thead>
<tr>
<th>Length of Stay in Niagara Frontier Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Only</td>
</tr>
<tr>
<td>One Night</td>
</tr>
<tr>
<td>Two Nights</td>
</tr>
<tr>
<td>Three Nights</td>
</tr>
<tr>
<td>Four or More Nights</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median Length of Stay (nights)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accommodations Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did Not Stay Overnight</td>
</tr>
<tr>
<td>Hotel/Motel</td>
</tr>
<tr>
<td>Homes of Friends/Relatives</td>
</tr>
<tr>
<td>Campground or Other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median Travel Party Size (persons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>$44,348</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median Expenditures in the Niagaga Frontier Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per Party Per Trip</td>
</tr>
<tr>
<td>Per Party Per Day</td>
</tr>
<tr>
<td>Per Person Per Trip</td>
</tr>
<tr>
<td>Per Person Per Day</td>
</tr>
</tbody>
</table>
Table 14  
(Continued)

<table>
<thead>
<tr>
<th>Area of Origin</th>
<th>Percent of Total Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York State</td>
<td>28%</td>
</tr>
<tr>
<td>Ontario (Canada)</td>
<td>15</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>9</td>
</tr>
<tr>
<td>New Jersey</td>
<td>8</td>
</tr>
<tr>
<td>Ohio</td>
<td>8</td>
</tr>
<tr>
<td>Connecticut</td>
<td>5</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>5</td>
</tr>
<tr>
<td>Other States</td>
<td>22</td>
</tr>
</tbody>
</table>

1/ Based on 375 responses to a mail questionnaire distributed by the Greater Buffalo Convention and Visitors Bureau.

Source: Greater Buffalo Convention and Visitors Bureau and Harrison Price Company.
Visitor Expenditures

A distribution of the previously referenced $139 average per capita tourist expenditure is shown in Table 15. Food and beverage spending accounts for the largest share of the tourist dollar at one-third of the total, followed by lodging at some 23 percent, and gasoline and other auto expenses at 16 percent. Visitor spending on entertainment and recreation represents 8 percent of the travel dollar and is equivalent to slightly less than $5 per person daily. Combined spending on food, entertainment, and retail goods—the categories of greatest interest to this analysis—is estimated at nearly $30 daily per person, a substantial average that attests to appreciable discretionary spending power within the tourist market.

AGGREGATE MARKET SUPPORT

A summary of aggregate resident and tourist market support available to Buffalo Harbor Center is contained in Table 16. Overall market size, as shown, will approximate 12.7 million persons by 1995, with longer-term forecasts calling for 13.8 million by 2000 and 14.7 million by 2005. Given a basically static resident population base, tourists comprise in excess of 85 percent of the total available market and can be expected to contribute substantially to the attendance mix at the subject attraction. The Buffalo market is compared to that of selected aquarium cities in Table 17. As shown, it is on a par with Boston and Baltimore and considerably larger than Monterey or New Orleans, both of which have developed eminently successful aquarium attractions. Heavy reliance on tourism is somewhat disadvantageous in view of the concentration of tourist activity in the Niagara Falls portion of the market area, as opposed to Buffalo, and the appreciable competitive challenge this implies. Market capture and attendance projections to be developed in the next section of this report will accordingly take this important factor into account.
Table 15

DISTRIBUTION OF TOURIST SPENDING IN THE NIAGARA FRONTIER REGION 1991

<table>
<thead>
<tr>
<th>Expenditure Category</th>
<th>Percent of Total 1/</th>
<th>Median Per Capita Expenditure 2/</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Per Trip</td>
</tr>
<tr>
<td>Public Transportation</td>
<td>11.3%</td>
<td>$15.73</td>
</tr>
<tr>
<td>Gasoline and Automotive Services</td>
<td>15.8</td>
<td>21.99</td>
</tr>
<tr>
<td>Lodging</td>
<td>23.5</td>
<td>32.71</td>
</tr>
<tr>
<td>Food and Beverages</td>
<td>33.2</td>
<td>46.21</td>
</tr>
<tr>
<td>Entertainment/Recreation</td>
<td>8.0</td>
<td>11.14</td>
</tr>
<tr>
<td>Retail Purchases</td>
<td>8.2</td>
<td>11.41</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>$139.19</td>
</tr>
</tbody>
</table>

1/ Based on a 1986 study of the economic impact of travel to Erie and Niagara counties by the U.S. Travel Data Center.

2/ Based on a 1991 mail survey by the Greater Buffalo Convention and Visitors Bureau (see Table 14).

Source: Greater Buffalo Convention and Visitors Bureau and Harrison Price Company.
Table 16

AGGREGATE MARKET SUPPORT FOR
BUFFALO WATERFRONT ATTRACTIONS
1990-2005

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident Market</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary (0-25 miles)</td>
<td>1,151</td>
<td>1,125</td>
<td>1,136</td>
<td>1,141</td>
</tr>
<tr>
<td>Secondary (25-50 miles)</td>
<td>632</td>
<td>632</td>
<td>638</td>
<td>642</td>
</tr>
<tr>
<td>Subtotal</td>
<td>1,783</td>
<td>1,757</td>
<td>1,774</td>
<td>1,783</td>
</tr>
<tr>
<td>Tourist Market</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overnight Visitors</td>
<td>7,300</td>
<td>8,000</td>
<td>9,000</td>
<td>9,900</td>
</tr>
<tr>
<td>Day Visitors</td>
<td>2,800</td>
<td>2,900</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Subtotal</td>
<td>10,100</td>
<td>10,900</td>
<td>12,000</td>
<td>12,900</td>
</tr>
<tr>
<td>Total</td>
<td>11,883</td>
<td>12,657</td>
<td>13,774</td>
<td>14,683</td>
</tr>
</tbody>
</table>

Source: Tables 5 and 12 and Harrison Price Company.
Table 17

COMPARATIVE SIZE OF SELECTED U.S. METRO AREA MARKETS
1990

<table>
<thead>
<tr>
<th>Metro Area</th>
<th>Resident 1/</th>
<th>Tourist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York, NY</td>
<td>18,101</td>
<td>18,500</td>
<td>36,601</td>
</tr>
<tr>
<td>Chicago, IL</td>
<td>7,221</td>
<td>11,000</td>
<td>18,221</td>
</tr>
<tr>
<td>Boston, MA</td>
<td>4,921</td>
<td>8,000</td>
<td>12,921</td>
</tr>
<tr>
<td>BUFFALO-NIAGARA FALLS, NY</td>
<td>1,783</td>
<td>10,100</td>
<td>11,883</td>
</tr>
<tr>
<td>Baltimore, MD</td>
<td>6,545</td>
<td>5,000</td>
<td>11,545</td>
</tr>
<tr>
<td>Seattle, WA</td>
<td>2,601</td>
<td>6,000</td>
<td>8,601</td>
</tr>
<tr>
<td>Monterey, CA</td>
<td>4,302</td>
<td>4,000</td>
<td>8,302</td>
</tr>
<tr>
<td>New Orleans, LA</td>
<td>1,550</td>
<td>6,000</td>
<td>7,550</td>
</tr>
</tbody>
</table>

1/ Within approximately 50 miles.

Section 5

ATTENDANCE FORECASTS AND PHYSICAL SIZING GUIDELINES

Preceding sections of this report have described the site and competitive environment for Buffalo Harbor Center and evaluated available market support. Findings with respect to these factors can now be combined with an examination of comparable market capture experience to arrive at an estimated range of attendance for the subject attraction. This section accordingly contains the attendance analysis, followed by a determination of associated sizing guidelines for major project elements.

ESTIMATED MARKET CAPTURE AND ATTENDANCE

Attendance volume achieved by a recreation attraction is a function of several interrelated variables, including market size and characteristics, the quality and scope of development, location, management efficiency, admission pricing policy, extent of direct competition in the marketplace, and the aggressiveness of the marketing and promotion effort. A viable and appropriate concept in tandem with certain specific assumptions to be enumerated momentarily will facilitate substantial impact on the available market.

Experience of Comparable Attractions

In establishing realistic attendance targets for Buffalo Harbor Center, the experience of other selected attractions, both existing facilities in the Niagara Frontier area as well as major attractions elsewhere in the country, furnishes useful guidelines. Table 18 shows current attendance volume and gross market capture rates (total attendance divided by combined resident and tourist market size) for a number of existing recreation facilities in the Buffalo region. Capture can be seen to range from less than 1 percent at the smaller attractions up to about 10 percent at the larger attractions. These capture rates are comparatively modest and provide strong evidence of the vigorous competition taking place for tourist attention. Excluding Niagara Falls itself—which
Table 18
MARKET CAPTURE RATES OF SELECTED EXISTING
ATTRACTIONS IN THE BUFFALO-NIAGARA FALLS AREA
1991

<table>
<thead>
<tr>
<th>Attraction</th>
<th>Annual Attendance (thousands)</th>
<th>Gross Market Capture Rate 2/</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Buffalo Area</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Darien Lake Theme Park</td>
<td>1,144</td>
<td>10%</td>
</tr>
<tr>
<td>Buffalo Zoological Gardens</td>
<td>506</td>
<td>4</td>
</tr>
<tr>
<td>Albright-Knox Art Gallery</td>
<td>220</td>
<td>2</td>
</tr>
<tr>
<td>Buffalo Museum of Science</td>
<td>129</td>
<td>1</td>
</tr>
<tr>
<td>Buffalo &amp; Erie County Naval and Servicemen's Park</td>
<td>66</td>
<td>&lt;1</td>
</tr>
<tr>
<td><strong>Niagara Falls (New York) Area</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prospect Point Observation Tower</td>
<td>893</td>
<td>8%</td>
</tr>
<tr>
<td>Aquarium of Niagara Falls</td>
<td>450</td>
<td>4</td>
</tr>
<tr>
<td>Cave of the Winds</td>
<td>245</td>
<td>2</td>
</tr>
<tr>
<td>Viewmobile</td>
<td>205</td>
<td>2</td>
</tr>
<tr>
<td>Native American Center for the Living Arts</td>
<td>30</td>
<td>&lt;1</td>
</tr>
<tr>
<td><strong>Niagara Falls (Ontario) Area</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maid of the Mist Incline Railway</td>
<td>1,046</td>
<td>9%</td>
</tr>
<tr>
<td>Table Rock Scenic Tunnels</td>
<td>909</td>
<td>8</td>
</tr>
<tr>
<td>Falls Incline Railway</td>
<td>800</td>
<td>7</td>
</tr>
<tr>
<td>Niagara Falls IMAX Theater</td>
<td>650</td>
<td>5</td>
</tr>
<tr>
<td>Maple Leaf Village Amusement Park</td>
<td>605</td>
<td>5</td>
</tr>
<tr>
<td>Queen Victoria Park Greenhouse</td>
<td>368</td>
<td>3</td>
</tr>
<tr>
<td>Niagara Spanish Aerocar</td>
<td>205</td>
<td>2</td>
</tr>
<tr>
<td>Guinness World of Records Museum</td>
<td>170</td>
<td>1</td>
</tr>
<tr>
<td>Great Gorge Adventure</td>
<td>113</td>
<td>1</td>
</tr>
</tbody>
</table>

1/ Total attendance divided by a combined resident and tourist market of 11.9 million in 1990 (see Table 16).

Source: Harrison Price Company.
presumably draws most or all of the estimated 10 million tourist visits to the area—none of these facilities has a dominant share of the market; rather, tourist support is splintered among the diversity of commercial, natural, and educational options vying for tourist business.

The Buffalo Harbor Center concept is in essence a hybrid of major aquarium and major science center. A review of kindred operations around the country thus offers further insight into the degree of market capture potentially attainable. The characteristics of major aquariums are delineated in Table 19, while attendance and market penetration rates for these attractions are calculated in Table 20. For purposes of evaluating relative performance, it should be mentioned, 1990 attendance figures have been used rather than 1991—the Gulf War and the national recession depressed attendance at virtually all attractions during 1991 and distorts the true drawing power of the various facilities. As indicated in Table 20, gross market capture extends from a low of 2 percent at the New York Aquarium with its huge and highly competitive market to a high of 29 percent at the Monterey Bay Aquarium in California, a comparatively small market where the aquarium is the main visitor destination. Other high capture rates are associated with the new Aquarium of the Americas in New Orleans (23 percent) and the National Aquarium in Baltimore (20 percent), which recently added a marine mammal stadium that has met with enthusiastic public response.

Turning to major science/technology centers, Table 21 presents salient characteristics of a representative sample of attractions, while Table 22 calculates respective market capture rates. By and large, science museums do not achieve the degree of attendance support commonly experienced by aquariums despite their usually lower admission charges—the appeal of live animals is the principal influence, which deliver an entertainment value commensurate with a higher price of admission. The greatest capture rate among the facilities listed in the table is reported by the Houston Museum of Natural Science, riding on the success of its recently opened IMAX theater. The Pacific Science Center in Seattle, the Boston Museum of Science, and the Denver Museum of Natural History follow in the 12 to 14 percent gross capture range. Program excellence is chiefly instrumental in these cases, along with strong local market support. The lower end of the range is represented by such
<table>
<thead>
<tr>
<th>Aquarium</th>
<th>Year Established</th>
<th>Governing Authority</th>
<th>Adult Admission Fee</th>
<th>1990 Attendance (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquarium of the Americas (New Orleans, LA)</td>
<td>1990</td>
<td>City/private nonprofit</td>
<td>$8.00</td>
<td>1,902</td>
</tr>
<tr>
<td>Monterey Bay Aquarium (Monterey, CA)</td>
<td>1984</td>
<td>Private nonprofit</td>
<td>$9.75</td>
<td>1,760</td>
</tr>
<tr>
<td>National Aquarium (Baltimore, MD)</td>
<td>1981</td>
<td>Private nonprofit</td>
<td>$11.50</td>
<td>1,496</td>
</tr>
<tr>
<td>New England Aquarium (Boston, MA)</td>
<td>1969</td>
<td>Private nonprofit</td>
<td>$7.50</td>
<td>1,311</td>
</tr>
<tr>
<td>Shedd Aquarium (Chicago, IL)</td>
<td>1924</td>
<td>Private nonprofit</td>
<td>$3.00 Aquarium $7.00 Aquar/Ocean</td>
<td>1,289</td>
</tr>
<tr>
<td>New York Aquarium (Brooklyn, NY)</td>
<td>1896</td>
<td>City/private nonprofit</td>
<td>$5.75</td>
<td>751</td>
</tr>
<tr>
<td>Seattle Aquarium (Seattle, WA)</td>
<td>1977</td>
<td>City</td>
<td>$6.00</td>
<td>620</td>
</tr>
</tbody>
</table>

Source: Harrison Price Company.
### Table 20

**MARKET CAPTURE RATES OF MAJOR AQUARIUMS IN THE UNITED STATES 1990**

<table>
<thead>
<tr>
<th>Aquarium</th>
<th>Annual Attendance (thousands)</th>
<th>Estimated Distribution of Attendance</th>
<th>Market Size (thousands)</th>
<th>Market Capture Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>resident 1/</td>
<td>tourist 1/</td>
<td>tourist</td>
</tr>
<tr>
<td>Monterey Bay Aquarium (Monterey, CA)</td>
<td>1,760</td>
<td>42%</td>
<td>58%</td>
<td></td>
</tr>
<tr>
<td>Aquarium of the Americas (New Orleans, LA)</td>
<td>1,902</td>
<td>31%</td>
<td>69%</td>
<td></td>
</tr>
<tr>
<td>National Aquarium (Baltimore, MD)</td>
<td>1,496</td>
<td>49%</td>
<td>51%</td>
<td></td>
</tr>
<tr>
<td>New England Aquarium (Boston, MA)</td>
<td>1,311</td>
<td>65%</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>Shedd Aquarium (Chicago, IL)</td>
<td>1,289</td>
<td>51%</td>
<td>49%</td>
<td></td>
</tr>
<tr>
<td>Seattle Aquarium (Seattle, WA)</td>
<td>620</td>
<td>48%</td>
<td>52%</td>
<td></td>
</tr>
<tr>
<td>New York Aquarium (Brooklyn, NY)</td>
<td>751</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

n/a means not available.

1/ Resident population within approximately 50 miles.

Source: Harrison Price Company.
## Table 21

**CHARACTERISTICS OF SELECTED SCIENCE/TECHNOLOGY MUSEUMS IN THE UNITED STATES**

1992

<table>
<thead>
<tr>
<th>Museum</th>
<th>Year Established</th>
<th>Governing Authority</th>
<th>Adult Admission Fee</th>
<th>1990 Attendance (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houston Museum of Natural Science (Houston, TX)</td>
<td>1909</td>
<td>Private nonprofit</td>
<td>$2.50 Gen Adm</td>
<td>1,893</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$4.50 IMAX</td>
<td></td>
</tr>
<tr>
<td>Boston Museum of Science (Boston, MA)</td>
<td>1830</td>
<td>Private nonprofit</td>
<td>$6.00 Gen Adm</td>
<td>1,602</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$6.00 OMNI</td>
<td></td>
</tr>
<tr>
<td>Denver Museum of Natural History (Denver, CO)</td>
<td>1900</td>
<td>City/private nonprofit</td>
<td>$4.00 Gen Adm</td>
<td>1,355</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$5.00 IMAX</td>
<td></td>
</tr>
<tr>
<td>Pacific Science Center (Seattle, WA)</td>
<td>1962</td>
<td>Private nonprofit</td>
<td>$5.00 Gen Adm</td>
<td>1,200</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$4.00 IMAX</td>
<td></td>
</tr>
<tr>
<td>Franklin Institute (Philadelphia, PA)</td>
<td>1824</td>
<td>Private nonprofit</td>
<td>$8.50 Gen Adm</td>
<td>932</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$6.00 OMNI</td>
<td></td>
</tr>
<tr>
<td>Reuben Fleet Science Center (San Diego, CA)</td>
<td>1973</td>
<td>Private nonprofit</td>
<td>$2.25 Gen Adm</td>
<td>681</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$5.50 OMNI</td>
<td></td>
</tr>
<tr>
<td>Maryland Science Center (Baltimore, MD)</td>
<td>1797</td>
<td>Private nonprofit</td>
<td>$8.50 Gen Adm and IMAX</td>
<td>540</td>
</tr>
</tbody>
</table>

Source: Harrison Price Company.
Table 22
MARKET CAPTURE RATES OF SELECTED SCIENCE/TECHNOLOGY MUSEUMS IN THE UNITED STATES 1990

<table>
<thead>
<tr>
<th>Attraction</th>
<th>Annual Attendance (thousands)</th>
<th>Estimated Distribution of Attendance</th>
<th>Market Size (thousands)</th>
<th>Market Capture Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Resident</td>
<td>Tourist</td>
<td>Resident</td>
</tr>
<tr>
<td>Houston Museum of Natural Science (Houston, TX)</td>
<td>1,893</td>
<td>n/a</td>
<td>n/a</td>
<td>3,651</td>
</tr>
<tr>
<td>Pacific Science Center (Seattle, WA)</td>
<td>1,200</td>
<td>60%</td>
<td>40%</td>
<td>2,429</td>
</tr>
<tr>
<td>Boston Museum of Science (Boston, MA)</td>
<td>1,602</td>
<td>75%</td>
<td>25%</td>
<td>4,921</td>
</tr>
<tr>
<td>Denver Museum of Natural History (Denver, CO)</td>
<td>1,355</td>
<td>n/a</td>
<td>n/a</td>
<td>2,306</td>
</tr>
<tr>
<td>American Museum of Natural History (New York, NY)</td>
<td>2,933</td>
<td>60%</td>
<td>40%</td>
<td>18,101</td>
</tr>
<tr>
<td>Franklin Institute (Philadelphia, PA)</td>
<td>932</td>
<td>82%</td>
<td>18%</td>
<td>5,938</td>
</tr>
<tr>
<td>Maryland Science Center (Baltimore, MD)</td>
<td>540</td>
<td>30%</td>
<td>70%</td>
<td>2,405</td>
</tr>
<tr>
<td>Reuben Fleet Science Center (San Diego, CA)</td>
<td>681</td>
<td>45%</td>
<td>55%</td>
<td>2,674</td>
</tr>
</tbody>
</table>

n/a means not available.
1/ Resident population within approximately 50 miles.

Source: Harrison Price Company.
attractions as the Reuben Fleet Science Center in San Diego (another incidence of a very large, but fiercely competitive marketplace), at a 2 percent overall capture.

**Projections for Buffalo Harbor Center**

Based on the foregoing review of comparable experience and findings regarding the Niagara Frontier market environment, estimates of market penetration and attendance for Buffalo Harbor Center are presented in Table 23. Estimates have been shown as a range from low to high, with a mid-range planning target, and are based on market size in the year 2000--assuming that the subject attraction opens in 1997, the third or fourth year of operation would represent the approximate point of stabilization. The following assumptions are integral to the projections:

- That the Buffalo complex will be developed to high standards of quality, with emphasis on state-of-the-art, interactive entertainment. With specific reference to the aquarium, this assumption encompasses the presentation of marine mammals or, alternatively, other signature animal attractions of compelling public interest. It is recognized that captivity of large, intelligent aquatic mammals is an emotional and controversial issue. The cause of public education is admirably served by first-hand observation of the beauty and capabilities of these animals, but this benefit is negated if the animals themselves are jeopardized in the process of acquisition and display. Notwithstanding this difficult question, it is necessary to point out as a purely economic matter that there are two existing aquariums in the regional market area (the Aquarium of Niagara Falls and Marineland of Canada), both of which feature extremely popular marine mammal shows. Without featured attractions of comparable allure--keeping in mind the increasingly jaded American audience--Buffalo Harbor Center would be at a serious competitive disadvantage. If it is ultimately decided not to include marine mammals, a significant programming challenge is implicit in the need to devise a stimulating alternative.
Table 23

POTENTIAL MARKET CAPTURE AND ATTENDANCE
BUFFALO HARBOR CENTER
Planning Year 2000

<table>
<thead>
<tr>
<th>Estimated Market Capture Rate</th>
<th>Range</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Resident Market</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary (0-25 miles)</td>
<td>30%</td>
<td>35%</td>
</tr>
<tr>
<td>Secondary (25-50 miles)</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>Subtotal</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Tourist Market</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overnight Visitors</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>Day Visitors</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Subtotal</td>
<td>7%</td>
<td>9%</td>
</tr>
<tr>
<td>Total</td>
<td>9%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Estimated Annual Attendance (thousands) 1/

<table>
<thead>
<tr>
<th>Estimated Annual Attendance (thousands)</th>
<th>Range</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Resident Market</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary (0-25 miles)</td>
<td>341</td>
<td>398</td>
</tr>
<tr>
<td>Secondary (25-50 miles)</td>
<td>96</td>
<td>128</td>
</tr>
<tr>
<td>Subtotal</td>
<td>437</td>
<td>525</td>
</tr>
<tr>
<td>Tourist Market</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overnight Visitors</td>
<td>720</td>
<td>900</td>
</tr>
<tr>
<td>Day Visitors</td>
<td>120</td>
<td>180</td>
</tr>
<tr>
<td>Subtotal</td>
<td>840</td>
<td>1,080</td>
</tr>
<tr>
<td>Total</td>
<td>1,277</td>
<td>1,605</td>
</tr>
</tbody>
</table>

Recommended Phase I Target (thousands)  

| Recommended Phase I Target (thousands) | Low  | High  |                  |
|----------------------------------------|------|-------|                  |
|                                        | 850  | 1,200 | 1,000            |

1/ Based on market size in the year 2000 as estimated in Table 16.

Source: Table 16 and Harrison Price Company.
• That sufficient public funds and/or private philanthropy will be available to develop the attraction to the standard of quality envisioned.

• That the attraction will be expertly managed and aggressively promoted to local residents and, especially, tourists. A well conceived marketing campaign is imperative in view of the competitive nature of the market.

• That attractive combination ticket pricing will be made available as a means of optimizing potential synergism among project components.

• That the facility will operate year-round, with extended hours during the peak summer tourist season.

• That a strong educational program will be developed in cooperation with area schools to assist in sustaining adequate levels of attendance during the tourist off-season.

Capture estimates indicated in Table 23 take into account the generally higher market penetration rates associated with aquariums as opposed to science centers, since the aquarium component of the project will undoubtedly be the primary magnet, but also consider the strength of competition for tourism with existing facilities in Niagara Falls. As indicated, an overall gross capture rate of 10 percent is projected as a realistic mid-range objective—the equal of the most successful existing attractions in the market area. Capture of the resident market within 50 miles is forecast at a substantial 27 percent on a mid-range basis given expected local response to the development of a first-rate attraction on the waterfront, including appreciable support from schools.

When applied to the market size estimates presented previously (refer to Table 16), projected capture rates translate into total annual attendance amounting to roughly 1.3 million as a baseline estimate and up to 1.6 million as an upside estimate. The mid-range target calls for some 1.4 million. Tourists will comprise roughly two-thirds of the total in concert with the relative size of this population in the market. Attendance volume of the indicated magnitude has important implications on the size and, hence, the cost of building Buffalo Harbor Center.
As a prudent course of action in light of the competitive situation and recognizable constraints on raising the needed public and private funding to implement the attraction, HPC recommends gearing a first-phase program to a more conservative attendance target. As indicated in Table 23, the suggested goal is a mid-range volume of approximately 1 million visits. A volume on this order not only appears readily attainable, but will also represent a realistic objective in the context of funding the project. Although a portion of theoretical market capture will be sacrificed by this approach, this loss is offset by the enhanced probability of bringing the project to fruition.

**Estimated Theater and Planetarium Attendance**

A subset of the overall attendance objective for Buffalo Harbor Center as just described is estimated patronage of the IMAX theater and planetarium planned for the site, support for which will be a function of basic aquarium/science center volume. As a frame of reference on comparable experience, Tables 24 and 25 highlight the characteristics of selected theaters and planetariums in other locations, while Table 26 expresses patronage at representative facilities as a percentage of total attendance volume at the museum within which they are featured. As Table 26 reveals, between 17 and 83 percent of all museum attendees typically enjoy theater presentations and 10 to 29 percent take in planetarium shows. The wide variance among different museums is chiefly a function of seating capacity--museums with a very large attendance base, such as the American Museum in New York, cannot always accommodate everyone who wants to see the show. Planetarium shows, it can be seen, are relatively less popular across the board and are primarily supported by school groups together with special family promotions during, for example, the Christmas holiday season.

The overall average participation rate for theaters amounts to slightly more than 40 percent, as indicated, whereas the rate for planetariums averages 15 percent. Using these figures as reasonable targets for Buffalo Harbor Center, Table 27 estimates a total mid-range patronage of 430,000 for the theater and 150,000 for the planetarium as a Phase I objective. Visitation by school groups is expected to be substantial in both instances and particularly for the planetarium--at the Denver Museum of Natural History, for example, schools
<table>
<thead>
<tr>
<th>Theater</th>
<th>Year Theater Opened</th>
<th>Governing Authority</th>
<th>Seating Capacity</th>
<th>Adult Admission Fee</th>
<th>Theater Attendance (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mugar Omni Theater, Boston Museum of Science (Boston, MA)</td>
<td>1930</td>
<td>Private nonprofit</td>
<td>334</td>
<td>$6.00</td>
<td>870</td>
</tr>
<tr>
<td>Wortham IMAX Theater, Houston Museum of Natural Science (Houston, TX)</td>
<td>1989</td>
<td>Private nonprofit</td>
<td>400</td>
<td>$4.50</td>
<td>823</td>
</tr>
<tr>
<td>Space Theater, Reuben Fleet Science Center (San Diego, CA)</td>
<td>1973</td>
<td>Private nonprofit</td>
<td>350</td>
<td>$5.50 1/</td>
<td>463</td>
</tr>
<tr>
<td>IMAX Theater, Denver Museum of Natural History (Denver, CO)</td>
<td>1983</td>
<td>City/private nonprofit</td>
<td>441</td>
<td>$5.00</td>
<td>437</td>
</tr>
<tr>
<td>IMAX Theater, Maryland Science Center (Baltimore, MD)</td>
<td>1987</td>
<td>Private nonprofit</td>
<td>422</td>
<td>$8.50 1/</td>
<td>405</td>
</tr>
<tr>
<td>Eames IMAX Theater, Pacific Science Center (Seattle, WA)</td>
<td>1979</td>
<td>Private nonprofit</td>
<td>382</td>
<td>$4.00</td>
<td>348</td>
</tr>
<tr>
<td>Tombaugh Space Theater, The Space Center (Alamogordo, NM)</td>
<td>1980</td>
<td>State</td>
<td>92</td>
<td>$3.75</td>
<td>141</td>
</tr>
</tbody>
</table>

1/ Fee includes general admission to the museum.

Source: Harrison Price Company.
<table>
<thead>
<tr>
<th>Planetarium</th>
<th>Year Established</th>
<th>Governing Authority</th>
<th>Seating Capacity</th>
<th>Adult Admission Fee</th>
<th>1990 Attendance (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free-Standing Planetariums</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adler Planetarium (Chicago, IL)</td>
<td>1930</td>
<td>Private nonprofit</td>
<td>450</td>
<td>$3.00</td>
<td>655</td>
</tr>
<tr>
<td>Hansen Planetarium (Salt Lake City, UT)</td>
<td>1965</td>
<td>County</td>
<td>217</td>
<td>Free</td>
<td>201</td>
</tr>
<tr>
<td>Flandrau Science Center (Tucson, AZ)</td>
<td>1975</td>
<td>University/private nonprofit</td>
<td>147</td>
<td>$3.75</td>
<td>140</td>
</tr>
<tr>
<td>Minneapolis Planetarium (Minneapolis, MN)</td>
<td>1961</td>
<td>Private nonprofit</td>
<td>n/a</td>
<td>$3.50</td>
<td>75</td>
</tr>
<tr>
<td>Cincinnati Planetarium (Cincinnati, OH)</td>
<td>1835</td>
<td>Private nonprofit</td>
<td>96</td>
<td>$3.00</td>
<td>56</td>
</tr>
<tr>
<td>Science Museum Planetariums</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hayden Planetarium, American Museum of Natural History (New York, NY)</td>
<td>1935</td>
<td>City/private nonprofit</td>
<td>n/a</td>
<td>$5.00</td>
<td>533</td>
</tr>
<tr>
<td>Einstein Planetarium, National Air &amp; Space Museum (Washington, D.C.)</td>
<td>1976</td>
<td>Federal charter</td>
<td>230</td>
<td>$2.50</td>
<td>325</td>
</tr>
</tbody>
</table>
### Table 25

(Continued)

<table>
<thead>
<tr>
<th>Planetarium</th>
<th>Year Established</th>
<th>Governing Authority</th>
<th>Seating Capacity</th>
<th>Adult Admission Fee</th>
<th>1990 Attendance (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gates Planetarium, Denver Museum of Natural History (Denver, CO)</td>
<td>1900</td>
<td>City/private nonprofit</td>
<td>n/a</td>
<td>$3.00</td>
<td>169</td>
</tr>
<tr>
<td>Starlab Planetarium, Pacific Science Center (Seattle, WA)</td>
<td>1962</td>
<td>Private nonprofit</td>
<td>50</td>
<td>$5.00 1/</td>
<td>168</td>
</tr>
<tr>
<td>Strasenburgh Planetarium, Rochester Science Center (Rochester, NY)</td>
<td>1912</td>
<td>Private nonprofit</td>
<td>230</td>
<td>$4.00</td>
<td>153</td>
</tr>
<tr>
<td>Houston Museum of Natural Science Planetarium (Houston, TX)</td>
<td>1909</td>
<td>Private nonprofit</td>
<td>232</td>
<td>$2.00</td>
<td>141</td>
</tr>
</tbody>
</table>

n/a means not available.

1/ Fee includes general admission to the museum.

Source: Harrison Price Company field survey.
<table>
<thead>
<tr>
<th>Science Center</th>
<th>Total Science Center Attendance (thousands)</th>
<th>Percent of Total Attendance Participating in Ancillary Attractions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston Museum of Science (Boston, MA)</td>
<td>1,052</td>
<td>83%</td>
<td>13%</td>
</tr>
<tr>
<td>Maryland Science Center (Baltimore, MD)</td>
<td>540</td>
<td>75</td>
<td>29</td>
</tr>
<tr>
<td>Reuben Fleet Science Center (San Diego, CA)</td>
<td>681</td>
<td>73</td>
<td>10</td>
</tr>
<tr>
<td>Franklin Institute (Philadelphia, PA)</td>
<td>932</td>
<td>45</td>
<td>n/a</td>
</tr>
<tr>
<td>Houston Museum of Natural Science (Houston, TX)</td>
<td>1,893</td>
<td>43</td>
<td>11</td>
</tr>
<tr>
<td>Denver Museum of Natural History (Denver, CO)</td>
<td>1,355</td>
<td>32</td>
<td>13</td>
</tr>
<tr>
<td>Pacific Science Center (Seattle, WA)</td>
<td>1,200</td>
<td>29</td>
<td>14</td>
</tr>
<tr>
<td>American Museum of Natural History (New York, NY)</td>
<td>2,933</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td><strong>Weighted Average</strong></td>
<td></td>
<td>41%</td>
<td>15%</td>
</tr>
</tbody>
</table>

n/a means not available.

1/ Includes laser shows where offered.

Source: Harrison Price Company.
### Table 27

**ESTIMATED THEATER AND PLANETARIUM ATTENDANCE AT BUFFALO HARBOR CENTER**

**Phase 1 Program**

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Low</strong></td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>Phase I Buffalo Harbor Center Attendance (thousands) 1/</td>
<td>850</td>
<td>1,200</td>
</tr>
<tr>
<td>Estimated Theater Participation Percent of Total Attendance</td>
<td>40%</td>
<td>45%</td>
</tr>
<tr>
<td>Number</td>
<td>340</td>
<td>540</td>
</tr>
<tr>
<td>Estimated Planetarium Participation Percent of Total Attendance</td>
<td>12%</td>
<td>18%</td>
</tr>
<tr>
<td>Number</td>
<td>102</td>
<td>216</td>
</tr>
</tbody>
</table>

---

1/ From Table 23.

Source: Harrison Price Company.
generate 17 percent of total theater patronage and more than 30 percent of total planetarium use.

ESTIMATED PHYSICAL CAPACITY REQUIREMENTS

An analysis of likely patterns of attendance is necessary to derive physical sizing guidelines for the subject attraction. The following paragraphs convert the attendance estimates just developed into demand for basic visitor facilities and services.

Design Day

It is neither economical nor necessary to plan a physical plant to accommodate absolute peaks in attendance; rather, a good balance is achieved if facilities are planned for the "design day," a term referring to the average of attendance on the top 15 to 20 days of the year. The result is a facility large enough to handle the heavy volume of visitors on the three or four highest days, albeit with some crowding, but at the same time, the facility is not so large as to appear empty during the slack periods that inevitably occur. As a first step in calculating design day requirements, Table 28 presents the monthly distribution of attendance at selected attractions, including three major destinations in Buffalo and three major aquariums in colder climates. A summer peak is characteristic of all of these operations, due not only to weather, but also to the typical concentration of tourism and family leisure activity in summer months. The Albright-Knox Art Gallery in Buffalo has the most even distribution of attendance throughout the year, a common pattern for art museums that is associated with the scheduling of special exhibitions. The most pronounced seasonality, on the other hand, is found at the Buffalo Zoo, which is primarily an outdoor entertainment experience and thus highly subject to the influence of weather.

Allowing that Buffalo Harbor Center will offer a combination of indoor and outdoor attractions and will also depend greatly on the tourist market compressed in summer months, it appears that a peak month factor on the order of 15 percent--which will likely occur in July or August--is realistic for Buffalo Harbor Center. On this basis, Table 29 shows that average weekly volume during the peak month would amount to some 34,000 visitors under the mid-
Table 28

MONTHLY DISTRIBUTION OF ATTENDANCE
AT SELECTED ATTRACTIONS
1990-91

<table>
<thead>
<tr>
<th>Month</th>
<th>Buffalo Zoo</th>
<th>Albright-Knox Art Gallery</th>
<th>Buffalo Museum of Science</th>
<th>National Aquarium (Baltimore)</th>
<th>New England Aquarium (Boston)</th>
<th>Seattle Aquarium (Seattle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>1.4%</td>
<td>6.0%</td>
<td>5.1%</td>
<td>4.7%</td>
<td>5.8%</td>
<td>5.2%</td>
</tr>
<tr>
<td>February</td>
<td>2.7</td>
<td>7.6</td>
<td>7.8</td>
<td>5.8</td>
<td>8.8</td>
<td>6.5</td>
</tr>
<tr>
<td>March</td>
<td>6.7</td>
<td>9.8</td>
<td>1.1</td>
<td>4.6</td>
<td>7.8</td>
<td>8.4</td>
</tr>
<tr>
<td>April</td>
<td>9.2</td>
<td>10.6</td>
<td>1.0</td>
<td>8.6</td>
<td>10.3</td>
<td>8.4</td>
</tr>
<tr>
<td>May</td>
<td>15.2</td>
<td>9.0</td>
<td>7.2</td>
<td>10.3</td>
<td>10.6</td>
<td>8.5</td>
</tr>
<tr>
<td>June</td>
<td>15.0</td>
<td>6.4</td>
<td>5.1</td>
<td>10.4</td>
<td>8.2</td>
<td>11.2</td>
</tr>
<tr>
<td>July</td>
<td>18.3</td>
<td>10.7</td>
<td>10.6</td>
<td>10.3</td>
<td>11.6</td>
<td>15.7</td>
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<td>August</td>
<td>13.1</td>
<td>9.1</td>
<td>17.5</td>
<td>11.5</td>
<td>12.3</td>
<td>15.4</td>
</tr>
<tr>
<td>September</td>
<td>8.6</td>
<td>6.0</td>
<td>7.6</td>
<td>10.8</td>
<td>5.8</td>
<td>7.4</td>
</tr>
<tr>
<td>October</td>
<td>5.9</td>
<td>7.8</td>
<td>9.9</td>
<td>9.0</td>
<td>7.1</td>
<td>5.3</td>
</tr>
<tr>
<td>November</td>
<td>2.1</td>
<td>9.4</td>
<td>14.7</td>
<td>8.3</td>
<td>7.6</td>
<td>4.6</td>
</tr>
<tr>
<td>December</td>
<td>1.8</td>
<td>7.6</td>
<td>12.4</td>
<td>5.7</td>
<td>4.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: Harrison Price Company.
Table 29

DESIGN DAY PLANNING GUIDELINES
FOR BUFFALO HARBOR CENTER
Phase I Program

<table>
<thead>
<tr>
<th></th>
<th>Range Low</th>
<th></th>
<th>Range High</th>
<th></th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Annual Attendance 1/</td>
<td>850,000</td>
<td>1,200,000</td>
<td>1,000,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak Month Attendance (at 15 percent) 2/</td>
<td>127,500</td>
<td>180,000</td>
<td>150,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Peak Week Attendance (at 4.43 weeks)</td>
<td>28,781</td>
<td>40,632</td>
<td>33,860</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design Day Attendance (at 25 percent of peak week)</td>
<td>7,195</td>
<td>10,158</td>
<td>8,465</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak On-Site Attendance (at 40 percent of design day) 3/</td>
<td>2,878</td>
<td>4,063</td>
<td>3,386</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rounded to</td>
<td>2,900</td>
<td>4,100</td>
<td>3,400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1/ From Table 23.
2/ Based on data contained in Table 28.
3/ Assumes an average visitor length of stay of approximately 2 hours.

Source: Harrison Price Company.
range, Phase I forecast. Experience at existing museums and aquariums further suggests that the average high day (design day, or the typical weekend day in summer) will be equivalent to 25 percent of the peak week, which in turn implies a design day capacity requirement of 8,500 persons as a mid-range target.

It was mentioned earlier in this report that the concept of the subject attraction should generate visitor stay times ranging from one to four hours, with two hours considered to be a reasonable average. Further assuming that a 12-hour operating schedule is established, the average maximum number of people on site at the busiest time of day--typically early afternoon--should approximate 40 percent of the design day total, or 3,400 visitors under the mid-range projection. This represents the simultaneous holding capacity requirement of the attraction—the sum of all lobbies, exhibit galleries, theater, planetarium, food service and merchandise sales facilities, general circulation, and other spaces open to the public.

**Theater and Planetarium Seating Requirements**

Based on patronage forecasts for the theater discussed earlier, seating requirements, presented in Table 30, are estimated at a mid-range 375 seats. In this instance, an average of 12 screenings per day during peak operating periods has been assumed (a typical schedule might be one screening every hour from 9:30 am to 8:30 pm on weekends in July). A further assumption is an average peak seat occupancy factor of 80 percent, or at the upper end of the 60 to 85 percent range commonly experienced at existing theaters.

For the planetarium, two estimates of required seating capacity have been prepared given two development alternatives available. The first, shown in Table 31, assumes a combination theater/planetarium based on adoption of the Omnimax (domed-screen) theater format. In this case, the combination facility would be largely devoted to theater screenings during the summer and on weekends through the year, whereas planetarium shows would be emphasized on weekdays during the school year--primarily November through March, when school demand will be highest. Because of fairly substantial crowd peaking due to the accommodation of school groups within a relatively
Table 30

DESIGN DAY PLANNING GUIDELINES
FOR A THEATER AT BUFFALO HARBOR CENTER
Phase I Program

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th></th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Estimated Annual Attendance 1/</td>
<td>340,000</td>
<td>540,000</td>
<td>430,000</td>
</tr>
<tr>
<td>Peak Month Attendance (at 15 percent) 2/</td>
<td>51,000</td>
<td>81,000</td>
<td>64,500</td>
</tr>
<tr>
<td>Average Peak Week Attendance (at 4.43 weeks)</td>
<td>11,512</td>
<td>18,284</td>
<td>14,560</td>
</tr>
<tr>
<td>Design Day Attendance (at 25 percent of peak week)</td>
<td>2,878</td>
<td>4,571</td>
<td>3,640</td>
</tr>
<tr>
<td>Assumed Number of Screenings on Design Day</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Average Number of People Per Screening</td>
<td>240</td>
<td>381</td>
<td>303</td>
</tr>
<tr>
<td>Estimated Seat Occupancy Rate</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Number of Seats Required</td>
<td>300</td>
<td>476</td>
<td>379</td>
</tr>
</tbody>
</table>

Rounded to

|               |            | 300            | 475            | 375            |

1/ From Table 27.
2/ Based on data contained in Table 28.

Source: Harrison Price Company.
## Table 31

**DESIGN DAY PLANNING GUIDELINES**
**FOR A PLANETARIUM AT BUFFALO HARBOR CENTER**
Combination Theater/Planetarium Alternative
Phase I Program

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th></th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Estimated Annual Attendance  1/</td>
<td>102,000</td>
<td>216,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Peak Month Attendance (at 20 percent) 2/</td>
<td>20,400</td>
<td>43,200</td>
<td>30,000</td>
</tr>
<tr>
<td>Average Peak Week Attendance (at 4.43 weeks)</td>
<td>4,605</td>
<td>9,752</td>
<td>6,772</td>
</tr>
<tr>
<td>Design Day Attendance (at 25 percent of peak week)</td>
<td>1,151</td>
<td>2,438</td>
<td>1,693</td>
</tr>
<tr>
<td>Assumed Number of Screenings on Design Day</td>
<td>6</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Average Number of People Per Screening</td>
<td>192</td>
<td>305</td>
<td>242</td>
</tr>
<tr>
<td>Estimated Seat Occupancy Rate</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Number of Seats Required</td>
<td>240</td>
<td>381</td>
<td>302</td>
</tr>
</tbody>
</table>

Rounded to

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>240</td>
<td>380</td>
<td>300</td>
</tr>
</tbody>
</table>

---

1/ From Table 27.
2/ Assumes attendance is heavily concentrated during the school year.

Source: Harrison Price Company.
limited period of time (basically Monday through Thursday between the hours of 10 am and 2 pm), the capacity requirement amounts to 300 seats as a mid-range target, or within the 375-seat parameter established for theater screenings. If, on the other hand, a free-standing planetarium is pursued, thus avoiding scheduling conflicts with theater shows, it is assumed that operations would follow the same basic pattern as the theater and thus be spread more evenly over the year--planetarium shows could be simultaneous with or overlap theater screenings. As indicated in Table 32, the seating requirement accordingly drops to 130 seats under this alternative. HPC understands that the design concept developed by Cambridge Seven Associates specifies a free-standing planetarium operation, in which event the 130-seat requirement applies.

**Estimated Food Service Requirements**

Design day planning guidelines indicate demand for food service facilities at Buffalo Harbor Center as delineated in Table 33. Highest demand for food service will logically occur between about 11 am and 2 pm. Assuming that 50 percent of the crowd on-site during these hours wishes to eat at the center (the remainder either eating elsewhere or skipping a meal), and further, that this demand will be more or less evenly spread over the three-hour period, maximum hourly demand would be equivalent to 17 percent of the on-site population at midday (50 percent divided by three hours equals 17 percent), or 578 meals or snacks each hour under the mid-range planning scenario. It has been further assumed that demand will be allocated between two basic types of food service facilities--a self-service cafe or food court facility offering complete meals and one or more snack stands dispensing beverages, ice cream, and other minimal-preparation items. Emphasis should be placed on the latter given the comparatively short average visitor stay time, which implies greater demand for simple refreshments as opposed to full meals. For planning purposes, HPC has assumed that snack stand demand will be equivalent to 70 percent of the total, with cafe service accounting for the balance. A typical seat turnover ratio for a cafe would be 2.5 turns per hour, yielding a requirement for about 70 seats. For snack stand operations, it is assumed that seats will rotate four times per hour on average, indicating demand for about 75 seats after allowing for the fact that perhaps three-fourths of all visitors choosing this option.
Table 32

DESIGN DAY PLANNING GUIDELINES
FOR A PLANETARIUM AT BUFFALO HARBOUR CENTER
Free-Standing Planetarium Alternative
Phase I Program

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Estimated Annual Attendance 1/</td>
<td>102,000</td>
<td>216,000</td>
</tr>
<tr>
<td>Peak Month Attendance (at 15 percent) 2/</td>
<td>15,300</td>
<td>32,400</td>
</tr>
<tr>
<td>Average Peak Week Attendance (at 4.43 weeks)</td>
<td>3,454</td>
<td>7,314</td>
</tr>
<tr>
<td>Design Day Attendance (at 25 percent of peak week)</td>
<td>863</td>
<td>1,828</td>
</tr>
<tr>
<td>Assumed Number of Screenings on Design Day</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Average Number of People Per Screening</td>
<td>78</td>
<td>152</td>
</tr>
<tr>
<td>Estimated Seat Occupancy Rate</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Number of Seats Required</td>
<td>98</td>
<td>190</td>
</tr>
<tr>
<td></td>
<td>Rounded to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>190</td>
</tr>
</tbody>
</table>

1/ From Table 27.
2/ Based on data contained in Table 28.

Source: Harrison Price Company.
Table 33

ESTIMATED FOOD SERVICE DEMAND
AT BUFFALO HARBOR CENTER
Phase I Program

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th></th>
<th>Mid-Range</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low (2,900)</td>
<td>High (4,100)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Design Day, Peak On-Site Attendance 1/</td>
<td>2,900</td>
<td>4,100</td>
<td>3,400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Hourly Demand for Food Service (at 17 percent) 2/</td>
<td>493</td>
<td>697</td>
<td>578</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Distribution of Demand by Type of Service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Service Cafe (at 30 percent)</td>
<td>148</td>
<td>209</td>
<td>173</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack Stand (at 70 percent)</td>
<td>345</td>
<td>488</td>
<td>405</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seating Capacity Required (rounded)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Service Cafe (at 2.5 turns per hour) 3/</td>
<td>60</td>
<td>85</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack Stand (at 4 turns per hour) 3/</td>
<td>65</td>
<td>90</td>
<td>75</td>
<td></td>
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</tr>
<tr>
<td>Total Seats</td>
<td>125</td>
<td>175</td>
<td>145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area Required (square feet) 4/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Service Cafe (at 20 sf per seat)</td>
<td>1,200</td>
<td>1,700</td>
<td>1,400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snack Stand (at 15 sf per seat)</td>
<td>975</td>
<td>1,350</td>
<td>1,125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Area (square feet)</td>
<td>2,175</td>
<td>3,050</td>
<td>2,525</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1/ From Table 29.
2/ Based on 50 percent of the on-site crowd desiring food service over a three-hour period from 11 am to 2 pm (50% + 3 hours = 17%).
3/ Assumes that 75 percent of visitors purchasing snacks or beverages will want a place to sit down with their purchase.
4/ Includes allowances for kitchen, circulation, and temporary storage; excludes warehouse.

Source: Harrison Price Company.
will want a place to sit down with their purchase. Seating requirements translate into building area of roughly 1,400 square feet for the cafe and 1,125 square feet for snack stands on a mid-range basis, or 2,525 square feet of food service space in total.

**Estimated Merchandise Sales Space Requirements**

Table 34 estimates merchandise sales space requirements for Buffalo Harbor Center. The financial analysis in the next section of this report will show that visitor spending on retail items at the subject attraction are expected to average some $1.50 per capita (constant 1992 dollars) on a mid-range basis. Given annual attendance projections discussed earlier for Phase I, total gross merchandise sales will accordingly come to $1.5 million annually. The minimum sales objective in operations of this type would be $1,000 per square foot, yielding mid-range demand for 1,500 square feet of sales space. This space would likely be provided in two sales units--a main gift shop near the entrance/exit to the attraction of perhaps 1,000 to 1,200 square feet, and a satellite shop in or immediately adjacent to the theater containing the remaining 300 to 500 square feet. The main outlet would feature an appealing assortment of books, educational toys, games, and videos, souvenirs, and other merchandise capturing the theme of the attraction. The theater outlet, meanwhile, would offer a changing mix of posters, books, and mementos drawing on the subject matter of currently presented films.
Table 34

ESTIMATED MERCHANDISE SALES SPACE DEMAND
AT BUFFALO HARBOR CENTER
Phase I Program

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th></th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Annual Attendance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(thousands) 1/</td>
<td>850</td>
<td>1,200</td>
<td>1,000</td>
</tr>
<tr>
<td>Estimated Per Capita Expenditure on Merchandise 2/ 3/</td>
<td>$1.25</td>
<td>$1.75</td>
<td>$1.50</td>
</tr>
<tr>
<td>Total Gross Merchandise Sales</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(thousands) 3/</td>
<td>$1,063</td>
<td>$2,100</td>
<td>$1,500</td>
</tr>
<tr>
<td>Target Sales Ratio Per Square Foot 3/</td>
<td>≤------------------------ $1,000 ≤------------------------&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supportable Merchandise Sales Area 4/</td>
<td>1,100</td>
<td>2,100</td>
<td>1,500</td>
</tr>
<tr>
<td>(square feet)</td>
<td>1,100</td>
<td>2,100</td>
<td>1,500</td>
</tr>
</tbody>
</table>

1/ From Table 23.
2/ From Table 40.
3/ In constant 1992 dollars.
4/ Includes circulation and temporary storage; excludes warehouse.

Source: Harrison Price Company.
Section 6

FINANCIAL ANALYSIS

The financial implications of the Buffalo Harbor Center project are assessed in this section of the report, incorporating the attendance forecasts set forth in the preceding section. All amounts, it should be noted, are expressed in constant 1992 dollars and do not take into account inflation. While every effort has been made to ensure a conservative, realistic appraisal of the project's economic performance, certain independent assumptions have nevertheless been made that influence financial results. These assumptions, described where applicable as the analysis unfolds, are subject to change and/or refinement as planning reaches successively more definitive stages.

ESTIMATED OPERATING REVENUES

Operating revenues at Buffalo Harbor Center will be primarily generated by visitor spending at the site. It is also envisioned that the project, as a nonprofit enterprise, would develop a membership support group, partly as an additional source of revenue and partly as a source of supplemental programming (member-sponsored events) and volunteer services. Additionally, aquariums and museums have become increasingly popular for various kinds of special events--receptions, convention banquets, seminars, and so on--normally staged after public hours, which in many situations generates substantial ancillary income. There may be further opportunities for certain kinds of sponsorships and grants given the project's educational mission; however, these sources of operating income will be far less significant than the aforementioned, and it is in any case premature to attempt an estimate of their potential magnitude. Accordingly, this analysis will be concerned only with spending by center attendees on admissions, food and beverages, and merchandise, plus the sale of memberships and facility rentals for special events.
Admissions Revenue

Admission tickets represent the largest source of revenue at the subject attraction. To provide a frame of reference on an appropriate pricing structure, Table 35 shows current admission fees at major aquariums in the United States, while corresponding data for major science/technology museums are presented in Table 36. As has been mentioned previously, aquariums as a rule command higher general admission fees than do science museums. However, the latter commonly have a number of add-on fees attached to theaters, planetariums, and laser shows (and often also for occasional special exhibitions), ultimately resulting in combination ticket prices comparable to or higher than prevailing fees at aquariums.

In consideration of these data and the conceptual plan for Buffalo Harbor Center, HPC suggests a three-option ticket package--an exhibits-only ticket, a theater-only ticket, and a combination price allowing admission to all available attractions. It is further assumed that the exhibits-only and combination tickets would provide "free" admission to the planetarium since this is a comparatively weak draw for other than the school market (and school groups would likely be admitted free to the planetarium in any case, or at least at very nominal cost, as an educational service). It is possible that certain special planetarium shows--a Christmas sky show, for instance--can be separately ticketed and, likewise, that certain of the envisioned LAKEWATCH CENTER activities may warrant a separate charge. Until more definitive information is available on programming, however, this analysis will be confined to the three major options described above.

Table 37 contains an illustrative pricing schedule for the attraction. As indicated, an adult ticket price of $9.75 (1992 dollars) is preliminarily recommended for the exhibits-only option, while the theater-only ticket is estimated at $5.50 and the combination ticket at $12.95. Scaled-down prices would be made available for children under 12 years and for senior citizens. A schedule of this general description should represent a reasonable and acceptable price in the Buffalo marketplace on the basis of the entertainment value that the attraction will deliver.
<table>
<thead>
<tr>
<th>Aquarium</th>
<th>Adult</th>
<th>Child (Age Range)</th>
<th>Senior Citizen</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Aquarium (Baltimore)</td>
<td>$11.50</td>
<td>$6.75 (3-11)</td>
<td>$8.75</td>
</tr>
<tr>
<td>Monterey Bay Aquarium (California)</td>
<td>9.75</td>
<td>4.50 (3-12)</td>
<td>7.25</td>
</tr>
<tr>
<td>Tennessee State Aquarium (Chattanooga)</td>
<td>8.75</td>
<td>4.75 (3-11)</td>
<td>8.75</td>
</tr>
<tr>
<td>New Jersey State Aquarium (Camden)</td>
<td>8.50</td>
<td>5.50 (3-11)</td>
<td>7.00</td>
</tr>
<tr>
<td>Aquarium of the Americas (New Orleans)</td>
<td>8.00</td>
<td>4.25 (3-11)</td>
<td>6.25</td>
</tr>
<tr>
<td>New England Aquarium (Boston)</td>
<td>7.50</td>
<td>3.50 (3-15)</td>
<td>6.50</td>
</tr>
<tr>
<td>Texas State Aquarium (Corpus Christi)</td>
<td>7.00</td>
<td>3.75 (4-17)</td>
<td>5.00</td>
</tr>
<tr>
<td>Shedd Aquarium (Chicago)</td>
<td>3.00</td>
<td>2.00 (3-11)</td>
<td>2.00</td>
</tr>
<tr>
<td>Aquarium Only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquarium/Oceanarium Combination</td>
<td>7.00</td>
<td>5.00 (3-11)</td>
<td>5.00</td>
</tr>
<tr>
<td>Aquarium of Niagara Falls (New York)</td>
<td>5.95</td>
<td>3.95 (5-14)</td>
<td>3.95</td>
</tr>
</tbody>
</table>

Source: Harrison Price Company.
### Table 36

**ADMISSION PRICE SCHEDULE AT SELECTED SCIENCE/TECHNOLOGY MUSEUMS 1992**

<table>
<thead>
<tr>
<th>Museum</th>
<th>Individual Tickets</th>
<th>Combination Tickets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>General Admission</td>
<td>IMAX/Omni Theater</td>
</tr>
<tr>
<td>Franklin Institute (Philadelphia)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>$8.50</td>
<td>$6.00</td>
</tr>
<tr>
<td>Senior Citizen</td>
<td>7.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Child 4-11</td>
<td>7.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Boston Museum of Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>$6.00</td>
<td>$6.00</td>
</tr>
<tr>
<td>Senior Citizen</td>
<td>4.50</td>
<td>4.50</td>
</tr>
<tr>
<td>Child 4-11</td>
<td>4.50</td>
<td>4.50</td>
</tr>
<tr>
<td>Cincinnati Museum of Natural History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>$6.00</td>
<td>$5.00</td>
</tr>
<tr>
<td>Senior Citizen</td>
<td>5.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Child 3-12</td>
<td>3.00</td>
<td>3.50</td>
</tr>
<tr>
<td>Museum of Science &amp; Industry (Chicago)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>$5.00</td>
<td>$5.00</td>
</tr>
<tr>
<td>Senior Citizen</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Child 5-12</td>
<td>2.00</td>
<td>3.00</td>
</tr>
</tbody>
</table>
Table 36
(Continued)

<table>
<thead>
<tr>
<th>Museum</th>
<th>Individual Tickets</th>
<th>Combination Tickets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacific Science Center (Seattle)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>$5.00</td>
<td>$6.00</td>
</tr>
<tr>
<td>Senior Citizen</td>
<td>4.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Junior 6-13</td>
<td>4.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Child 2-5</td>
<td>3.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Denver Museum of Natural History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>$4.00</td>
<td>$7.75</td>
</tr>
<tr>
<td>Senior Citizen</td>
<td>2.00</td>
<td>6.00</td>
</tr>
<tr>
<td>Child 4-12</td>
<td>2.00</td>
<td>5.25</td>
</tr>
<tr>
<td>Houston Museum of Natural Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>$2.50</td>
<td>$6.00</td>
</tr>
<tr>
<td>Senior Citizen</td>
<td>2.00</td>
<td>4.50</td>
</tr>
<tr>
<td>Child 3-11</td>
<td>2.00</td>
<td>4.50</td>
</tr>
<tr>
<td>Student</td>
<td>1.00</td>
<td>3.00</td>
</tr>
</tbody>
</table>

n/o means not offered.

Source: Harrison Price Company.
### Table 37

**ESTIMATED PER CAPITA ADMISSIONS REVENUE**

**FOR BUFFALO HARBOR CENTER**

(Constant 1992 Dollars)

<table>
<thead>
<tr>
<th>Estimated Attendance Mix</th>
<th>Adult (&gt;12 Years)</th>
<th>Child/ Senior Citizen</th>
<th>Total or Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Attendance Mix</td>
<td>75%</td>
<td>25%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Ticket Price**

- **Aquarium/Technology Exhibits Only**
  - Adult: $9.75
  - Child: $6.50
  - Total: $8.94
- **Great Lakes Theater Only**
  - Adult: 5.50
  - Child: 3.75
  - Total: 5.06
- **Combination Ticket**
  - Adult: 12.95
  - Child: 8.50
  - Total: 11.84

**Estimated Distribution of Attendance by Ticket Type**

- **Aquarium/Technology Exhibits Only**
  - Adult: 55%
  - Child: 55%
  - Total: 55%
- **Great Lakes Theater Only**
  - Adult: 10%
  - Child: 10%
  - Total: 10%
- **Combination Ticket**
  - Adult: 35%
  - Child: 35%
  - Total: 35%

**Weighted Average Ticket Price**

- **Aquarium/Technology Exhibits Only**
  - Adult: $4.02
  - Child: $0.89
  - Total: $4.92
- **Great Lakes Theater Only**
  - Adult: 0.41
  - Child: 0.09
  - Total: 0.51
- **Combination Ticket**
  - Adult: 3.40
  - Child: 0.74
  - Total: 4.14

<table>
<thead>
<tr>
<th>Average Gross Per Capita Revenue</th>
<th>Adult</th>
<th>Child</th>
<th>Total or Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>$7.83</td>
<td>$1.73</td>
<td></td>
<td>$9.57</td>
</tr>
</tbody>
</table>

Less: Allowance for Promotional Discounts and Complimentary Admissions (at 25 percent) 1/ |

<table>
<thead>
<tr>
<th>Adult</th>
<th>Child</th>
<th>Total or Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.96</td>
<td>$0.43</td>
<td>$2.39</td>
</tr>
</tbody>
</table>

**Average Net Admissions Revenue**

<table>
<thead>
<tr>
<th>Adult</th>
<th>Child</th>
<th>Total or Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5.88</td>
<td>$1.30</td>
<td>$7.17</td>
</tr>
</tbody>
</table>

**Effective Yield on Adult Combination Price 2/**

| 55% |

---

1/ Includes members, school groups, children under 3 years old, and other discounted or complimentary admissions.

2/ Total per capita admissions revenue divided by adult combination price of $12.95.

Source: Harrison Price Company.
To determine effective per capita revenues derived from admission fees, it is first necessary to estimate attendance mix, which HPC projects at a ratio of three adults to one child/senior on the basis of typical experience at comparable attractions. Secondly, the mix of attendance by ticket category must also be estimated. It is difficult to predict the relative popularity of each ticket option—the concept of Buffalo Harbor Center is unique, thus rendering extrapolations from other museums of limited use. The distribution shown in the table is consequently by and large judgmental, but does take into account reported participation rates in added attractions at comparable facilities, the potential impact of different prices on various segments of the market, the fact that aquarium exhibits will constitute the principal attendance magnet, and the likelihood that relatively few people will come to see the theater only—most people would not consider a 30- or 40-minute entertainment experience to be worth the trip (except, possibly, in the case of the premier of an exceptional new film). Accordingly, HPC estimates that on average, 55 percent of all attendees will opt for the exhibits-only ticket, with 10 percent choosing the theater-only ticket, and the remaining 35 percent purchasing the combination package.

Application of the foregoing factors results in an average gross per capita ticket revenue of $9.57. A final necessary adjustment concerns policies with regard to discounting. HPC has assumed a moderately generous discount rate amounting to an average of 25 percent off gross ticket revenue. Discounts would be offered to school groups, as already mentioned, as well as other organized groups (conventioneers, civic organizations, and the like), and it is also envisioned that occasional promotional campaigns would be undertaken—a "family week" promotion once or twice per year, for example, when children would be admitted free when accompanied by an adult. There will also be a certain amount of complimentary admissions, including visiting dignitaries, groups of disadvantaged youngsters, and members (who would have unlimited free admission as a benefit of their membership dues). After subtracting the discount allowance, net per capita admissions revenue comes to $7.17. The latter is equivalent to an admission price "yield" of 55 percent (net per capita revenue divided by the gross adult combination ticket price). A yield of this magnitude is consistent with experience at other major aquariums, as shown in Table 38, and somewhat higher than usually reported for science museums.
<table>
<thead>
<tr>
<th>Aquarium or Museum</th>
<th>Per Capita Admissions Revenue 1/</th>
<th>Adult Ticket Price 2/</th>
<th>Effective Yield on Ticket Price 3/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquariums</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquarium of the Americas (New Orleans)</td>
<td>$5.36</td>
<td>$8.00</td>
<td>67%</td>
</tr>
<tr>
<td>New England Aquarium (Boston)</td>
<td>4.52</td>
<td>7.50</td>
<td>60</td>
</tr>
<tr>
<td>Monterey Bay Aquarium (California)</td>
<td>5.80</td>
<td>9.75</td>
<td>59</td>
</tr>
<tr>
<td>Shedd Aquarium (Chicago)</td>
<td>4.13</td>
<td>7.00</td>
<td>59</td>
</tr>
<tr>
<td>National Aquarium (Baltimore)</td>
<td>5.65</td>
<td>11.50</td>
<td>49</td>
</tr>
<tr>
<td>Science/Technology Museums</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denver Museum of Natural History</td>
<td>$3.02</td>
<td>$7.75</td>
<td>39%</td>
</tr>
<tr>
<td>Boston Museum of Science</td>
<td>4.59</td>
<td>14.00</td>
<td>33</td>
</tr>
<tr>
<td>Houston Museum of Natural Science</td>
<td>2.32</td>
<td>7.00</td>
<td>33</td>
</tr>
<tr>
<td>Pacific Science Center (Seattle)</td>
<td>1.70</td>
<td>6.00</td>
<td>28</td>
</tr>
</tbody>
</table>

1/ Includes general admission, theaters, planetariums, and other attractions requiring tickets.
2/ Adult combination price for general admission and any other attractions.
3/ Per capita admissions revenue divided by adult ticket price.

Source: Harrison Price Company.
(most of which have very liberal discount policies, particularly where the museum receives public tax support).

**Food and Merchandise Expenditures**

Visitor spending on food, beverages, and merchandise will be another major revenue source for Buffalo Harbor Center. Prevailing rates of spending at other aquariums and science museums are presented in Table 39. As indicated, food expenditures are modest as would be expected given typically short average visitor stay times and the lack of emphasis on such operations that is characteristic of nonprofit attractions, the range extending from less than 30 cents per capita to approximately $1.60 per capita. A wider variance can be noted in merchandise expenditures, with a low of 40 cents per capita and a high of some $3.70. The latter is anomalous in a nonprofit context and is associated with the superlative gift shop operation at the Monterey Bay Aquarium—merchandise mix at this attraction generally avoids inexpensive trinkets and instead emphasizes high-quality books, toys, videos, and art goods on the marine theme, which have been well received by the aquarium’s very affluent tourist market.

For conservative planning purposes, HPC projects visitor spending on food at Buffalo Harbor Center to amount to 80 cents per capita on a mid-range basis, as set forth in Table 40, while merchandise spending is projected at $1.50 per capita. These are both moderately ambitious goals and presume that food and retail offerings at the project will be of good quality and effectively marketed. With specific reference to gift shop operations, the theme of the attraction provides fertile opportunities for the development of unique and appealing items—the experience at Monterey and at other selected nonprofit facilities demonstrates that when visitors are genuinely inspired by the educational and entertainment experience, they respond readily to tangible mementos of their visit.

Combined visitor spending on admissions, food, and merchandise at Buffalo Harbor Center accordingly amounts to a mid-range total of $9.47, as Table 40 indicates. When multiplied by estimated attendance volume for Phase I, total gross revenue of about $9.5 million will accrue from these operations. To this
Table 39
VISITOR SPENDING ON FOOD AND MERCHANDISE
AT SELECTED AQUARIUMS AND SCIENCE MUSEUMS
1990-91

<table>
<thead>
<tr>
<th>Aquarium or Museum</th>
<th>Average Per Capita Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Food Service 1/</td>
</tr>
<tr>
<td><strong>Aquariums</strong></td>
<td></td>
</tr>
<tr>
<td>Monterey Bay Aquarium (California)</td>
<td>$1.03</td>
</tr>
<tr>
<td>New England Aquarium (Boston)</td>
<td>&lt;--------------------- 2.14 ----------------------&gt;</td>
</tr>
<tr>
<td>Aquarium of the Americas (New Orleans)</td>
<td>0.57</td>
</tr>
<tr>
<td>National Aquarium (Baltimore)</td>
<td>n/a</td>
</tr>
<tr>
<td>Shedd Aquarium (Chicago)</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Science/Technology Museums</strong></td>
<td></td>
</tr>
<tr>
<td>Boston Museum of Science</td>
<td>$1.57</td>
</tr>
<tr>
<td>Denver Museum of Natural History</td>
<td>&lt;--------------------- 1.57 ----------------------&gt;</td>
</tr>
<tr>
<td>Pacific Science Center (Seattle)</td>
<td>0.28</td>
</tr>
<tr>
<td>Houston Museum of Natural Science</td>
<td>n/a</td>
</tr>
</tbody>
</table>

n/a means not available.
1/ Excludes catering for special events.

Source: Harrison Price Company.
**Table 40**

**ESTIMATED OPERATING REVENUES FOR**
**BUFFALO HARBOR CENTER**
**Phase I Program**
**(Constant 1992 Dollars)**

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Estimated Annual Attendance (thousands)</td>
<td>850</td>
<td>1,200</td>
</tr>
<tr>
<td>Estimated Visitor Expenditure Per Capita</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admissions 1/</td>
<td>$7.17</td>
<td>$7.17</td>
</tr>
<tr>
<td>Food and Beverages</td>
<td>0.60</td>
<td>1.00</td>
</tr>
<tr>
<td>Merchandise</td>
<td>1.25</td>
<td>1.75</td>
</tr>
<tr>
<td>Total</td>
<td>$9.02</td>
<td>$9.92</td>
</tr>
<tr>
<td>Total Gross Visitor Expenditures (thousands)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admissions 1/</td>
<td>$6,095</td>
<td>$8,604</td>
</tr>
<tr>
<td>Food and Beverages</td>
<td>510</td>
<td>1,200</td>
</tr>
<tr>
<td>Merchandise</td>
<td>1,063</td>
<td>2,100</td>
</tr>
<tr>
<td>Total</td>
<td>$7,667</td>
<td>$11,904</td>
</tr>
<tr>
<td>Estimated Additional Earned Revenue (thousands)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memberships 2/</td>
<td>$360</td>
<td>$540</td>
</tr>
<tr>
<td>Special Events 3/</td>
<td>125</td>
<td>250</td>
</tr>
<tr>
<td>Total</td>
<td>$485</td>
<td>$790</td>
</tr>
<tr>
<td>Total Earned Revenue Gross (thousands)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$8,152</td>
<td>$12,694</td>
</tr>
<tr>
<td>Per Capita</td>
<td>$9.59</td>
<td>$10.58</td>
</tr>
</tbody>
</table>

1/ From Table 37.
2/ Based on 12,000 to 18,000 memberships at an average of $30.
3/ Based on 50 to 100 events annually at 250 persons each and average per capita revenue of $10.

Source: Harrison Price Company.
total, HPC has added an estimated $450,000 in membership revenue based on an assumed member roll of 15,000 as a mid-range target at an average cost of $30 per membership. Membership support groups exist at virtually all cultural institutions, whether operated publicly or privately. Memberships are sold on an annual or lifetime dues basis, with several options usually available (individual, family, patron, sponsor, and so on), as illustrated by the data for comparable existing facilities in Table 41. A goal of 15,000 members appears conservative in light of what has been achieved at similar attractions--the Monterey Aquarium currently has 77,000 members, the National Aquarium in Baltimore has 65,000, and the recently opened New Orleans aquarium has 45,000 members to date. Among science museums, the Denver Museum of Natural History reports a present membership roll of 28,000, while Seattle's Pacific Science Center and the Boston Museum of Science each have 26,000 members.

A conservative mid-range allowance of $200,000 annually in special events revenue has also been included, based on an assumed 80 events per year at an average of 250 people per event and a mean per capita expenditure of $10 (a prorated average of facility rent and catering income). These factors are highly conservative in view of experience at many cultural institutions. Large urban museums such as the Field Museum in Chicago and the American Museum in New York generate special events revenue exceeding $1 million per year. Some smaller museums and aquariums--which have less space available and cater smaller events--report nearly as much. The New Orleans aquarium, for example, generated more than $800,000 in special events revenue during its first full year of operation, attracting more than 140 separate functions. The Monterey Aquarium is currently achieving nearly $900,000 from activities of this type, numbering more than 200 each year. Clearly, the amount of revenue accruing from these special functions is directly related to the effort made to market the facility for this purpose and the quality of catering service provided. Buffalo Harbor Center may well be able to attain greater revenue from this source than has been estimated here given a major program to attract event business.
<table>
<thead>
<tr>
<th>Aquarium or Museum</th>
<th>Basic Membership Categories</th>
<th>Additional Membership Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aquariums</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monterey Bay Aquarium (California)</td>
<td>$38 Individual, $27 Student</td>
<td>Contributor's Circle ($100), Sustainer ($500), Associate ($1,000), Benefactor ($2,500)</td>
</tr>
<tr>
<td>Shedd Aquarium (Chicago)</td>
<td>35 Individual, n/o Student</td>
<td>Contributing ($100), Associate ($300), Sponsoring ($500), Patron ($1,000)</td>
</tr>
<tr>
<td>New England Aquarium (Boston)</td>
<td>35 Individual, 20 Student</td>
<td>Quartermaster ($60), Commodore ($75), Mariner ($100), Navigator ($1,250)</td>
</tr>
<tr>
<td>New York Aquarium</td>
<td>35 Individual, n/o Student</td>
<td>Sustaining ($75), Supporting ($125), Fellow ($250), Participating ($500), Patron ($1,000)</td>
</tr>
<tr>
<td>National Aquarium (Baltimore)</td>
<td>32 Individual, 29 Student</td>
<td>Family Plus ($95), Aquarist ($125), Curator ($250), Director ($500)</td>
</tr>
<tr>
<td><strong>Science/Technology Museums</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boston Museum of Science</td>
<td>$50 Individual, n/o Student</td>
<td>Sustaining ($150), Patron ($300), Fellow ($500), Director's Circle ($1,000)</td>
</tr>
<tr>
<td>Houston Museum of Natural Science</td>
<td>35 Individual, 35 Student</td>
<td>Sustaining ($75), Supporting ($125), Benefactor ($250), President's Circle ($500), Life ($1,500)</td>
</tr>
</tbody>
</table>

**Table 41**

MEMBERSHIP FEES AT SELECTED AQUARIUMS AND SCIENCE MUSEUMS 1992
Table 41

(Continued)

<table>
<thead>
<tr>
<th>Aquarium or Museum</th>
<th>Individual</th>
<th>Senior Citizen/ Student</th>
<th>Family</th>
<th>Additional Membership Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ft. Worth Museum of Science and History</td>
<td>$30</td>
<td>$25</td>
<td>$45</td>
<td>Supporter ($100), Sustainer ($250), Sponsor ($500), Patron ($1,000)</td>
</tr>
<tr>
<td>Denver Museum of Natural History</td>
<td>30</td>
<td>25</td>
<td>40</td>
<td>Supporting ($75), Patron ($150), Benefactor ($500), Naturalist Club ($1,000), Director's Circle ($5,000)</td>
</tr>
<tr>
<td>Pacific Science Center (Seattle)</td>
<td>20</td>
<td>n/o</td>
<td>35</td>
<td>Gold Card Family ($50), Contributor ($100), Supporter ($250), Sustainer ($500), Associate ($1,000), Patron ($2,500)</td>
</tr>
</tbody>
</table>

n/o means not offered.

Source: Harrison Price Company.
Total Gross Revenues

Aggregate gross revenues for the subject attraction as generated from all sources identified in this analysis are projected at $10.1 million as a Phase I, mid-range objective. Admissions revenue will represent approximately 70 percent of the total, followed by merchandise sales at 15 percent, and food sales at around 8 percent. On the whole, direct spending by visitors will contribute 93 percent of all operating revenue, with conservatively forecast memberships and special events generating the balance. It should be noted that no allowance has been made for unearned revenue--philanthropic donations and sponsorships arising from the private sector as well as grants, contributed services, and tax subsidies from the public sector. At many nonprofit operations, unearned revenues equal or surpass the earned-revenue total, although the most successful nonprofit institutions receive a minimum of about 70 percent of overall income on an earned basis.

Estimated Operating Expenses

Current operating expense ratios for existing aquariums and science museums, expressed as a dollar amount per visitor served, are presented in Table 42. Operating budgets for the different facilities listed are dependent on a number of factors, including the intensiveness of programming--especially educational programs (including outreach, or off-site programs), the sophistication of the exhibitry, the size of the internal research and scientific staff employed (whose work is not necessarily directly related to the public programs of the attraction), and other factors intrinsic to specific operations. With this important caveat in mind, per capita operating expenses are shown to range from a modest $2.90 per attendee to as much as $13.70 per capita. The higher figure is associated with the Boston Museum of Science, a respected institution that independently produces IMAX films and special exhibits that travel to other museums across the country. The range for major aquariums extends between $7.30 and $10.70 per capita.

Programming of Buffalo Harbor Center is, at this stage of planning, somewhat speculative, with much work to be done in establishing operating philosophy and goals with regard to both public programs and internal research efforts.
<table>
<thead>
<tr>
<th>Aquarium or Museum</th>
<th>Total Operating Budget (millions)</th>
<th>Total Attendance (thousands)</th>
<th>Per Capita Operating Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monterey Bay Aquarium (California)</td>
<td>$18. 8</td>
<td>1,760</td>
<td>$10.70</td>
</tr>
<tr>
<td>New England Aquarium (Boston)</td>
<td>11. 4</td>
<td>1,311</td>
<td>8.70</td>
</tr>
<tr>
<td>National Aquarium (Baltimore)</td>
<td>11. 7</td>
<td>1,496</td>
<td>7.80</td>
</tr>
<tr>
<td>Shedd Aquarium (Chicago)</td>
<td>9. 5</td>
<td>1,289</td>
<td>7.40</td>
</tr>
<tr>
<td>New York Aquarium</td>
<td>5. 5</td>
<td>751</td>
<td>7.30</td>
</tr>
<tr>
<td>Aquarium of the Americas (New Orleans)</td>
<td>9. 8</td>
<td>1,902</td>
<td>5.15</td>
</tr>
<tr>
<td>Science/Technology Museums</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boston Museum of Science</td>
<td>$22.0</td>
<td>1,602</td>
<td>$13.70</td>
</tr>
<tr>
<td>Denver Museum of Natural History</td>
<td>16. 4</td>
<td>1,355</td>
<td>12.10</td>
</tr>
<tr>
<td>Pacific Science Center (Seattle)</td>
<td>7. 7</td>
<td>1,200</td>
<td>6.40</td>
</tr>
<tr>
<td>Houston Museum of Natural Science</td>
<td>5. 5</td>
<td>1,893</td>
<td>2.90</td>
</tr>
</tbody>
</table>

Source: Harrison Price Company.
Assuming an overall policy and program similar to that of major existing aquariums, a reasonable estimate of the total operating budget per visitor may be about $8 as a mid-range target, or approximately $8 million in total. Table 43 distributes this budget by expense category based on a composite of experience at several existing aquariums and science museums. The largest single expense item, as indicated, will be labor and associated benefits, estimated at roughly $4.5 million annually (mid-range) for the Phase I project. Marketing and promotion is next in significance at some $810,000 annually, followed by utilities (encompassing water treatment and other animal life support systems) at $567,000, and operating supplies (the chief components of which are animal food and exhibit maintenance costs) at $486,000 per year. Basic operating expenses are shown to total $7.3 million under the mid-range scenario, to which a 10 percent contingency has been added, bringing overall expenses to $8.1 million.

The cost of food and merchandise goods sold must also be added to the operating expense total. As presented in Table 44, these costs are expected to amount to some $965,000 per year under the mid-range scenario, using cost ratios typical for recreation attractions. Combining the cost of goods sold with other operating expenses as just described, the overall ratio of expenses to gross earned operating revenue is approximately 90 percent. The latter ratio is consistent with experience at successful existing aquariums, including the National Aquarium in Baltimore, the Monterey Bay Aquarium, and the new Aquarium of the Americas in New Orleans.

**Estimated Net Operating Income**

Table 44 also indicates net operating income potentially attainable at Buffalo Harbor Center. For the initial-phase, mid-range scenario, a net income of slightly more than $1 million annually is estimated. Again, this is before any allowance for unearned, contributed funds (public or private), and represents the annual residual available for the reinvestment in facilities and programs that will be required on an ongoing basis to develop fresh program content stimulating repeat visitation. Operation of Buffalo Harbor Center, in conclusion, can be self-supporting given conformance to the basic assumptions employed in this analysis.
<table>
<thead>
<tr>
<th>Total Operating Expenses 1/ (thousands)</th>
<th>Range</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>ESTIMATED OPERATING EXPENSES FOR</td>
<td>$6,929</td>
<td>$9,521</td>
</tr>
<tr>
<td>BUFFALO HARBOR CENTER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase I Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant 1992 Dollars)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Distribution by Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Distribution by Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(thousands)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor and Benefits (55 percent)</td>
<td>$3,811</td>
<td>$5,237</td>
</tr>
<tr>
<td>Marketing and Promotion (10 percent)</td>
<td>693</td>
<td>952</td>
</tr>
<tr>
<td>Utilities (7 percent)</td>
<td>485</td>
<td>666</td>
</tr>
<tr>
<td>Supplies (6 percent)</td>
<td>416</td>
<td>571</td>
</tr>
<tr>
<td>Development and Memberships (4 percent)</td>
<td>277</td>
<td>381</td>
</tr>
<tr>
<td>Maintenance (4 percent)</td>
<td>277</td>
<td>381</td>
</tr>
<tr>
<td>Insurance (3 percent)</td>
<td>208</td>
<td>286</td>
</tr>
<tr>
<td>Miscellaneous (1 percent)</td>
<td>69</td>
<td>95</td>
</tr>
<tr>
<td>Subtotal</td>
<td>$6,236</td>
<td>$8,569</td>
</tr>
<tr>
<td>Contingency (10 percent)</td>
<td>693</td>
<td>952</td>
</tr>
<tr>
<td>Total</td>
<td>$6,929</td>
<td>$9,521</td>
</tr>
<tr>
<td>Per Capita</td>
<td>$8.15</td>
<td>$7.93</td>
</tr>
</tbody>
</table>

1/ From Table 44.

Source: Harrison Price Company.
Table 44

ESTIMATED NET OPERATING INCOME
FOR BUFFALO HARBOR CENTER
Phase I Program
(Constant 1992 Dollars)

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Total Gross Earned Revenue</td>
<td>$8,152</td>
<td>$10,120</td>
</tr>
<tr>
<td>(thousands)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less: Cost of Goods Sold</td>
<td>$153</td>
<td>$240</td>
</tr>
<tr>
<td>(thousands)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and Beverages 2/</td>
<td>$153</td>
<td>$360</td>
</tr>
<tr>
<td>Merchandise 3/</td>
<td>478</td>
<td>945</td>
</tr>
<tr>
<td>Special Events 4/</td>
<td>31</td>
<td>63</td>
</tr>
<tr>
<td>Total</td>
<td>$663</td>
<td>$1,368</td>
</tr>
</tbody>
</table>

| Total Net Earned Revenue  | $7,489         | $9,155        |
| (thousands)               |                |               |               |
| Less: Estimated Operating | $6,929         | $8,096        |
| Expenses (thousands) 5/   |                |               |               |
| Total Net Operating Income| $560           | $1,806        |
| (thousands) 6/            |                |               | $1,059        |

1/ From Table 40.
2/ At 30 percent of food and beverage sales (see Table 40).
3/ At 45 percent of merchandise sales (see Table 40).
4/ At 25 percent of special events revenue (see Table 40).
5/ At 75 to 85 percent of total gross earned revenue.
6/ Represents residual available for ongoing capital improvements.

Source: Harrison Price Company.
Development of Buffalo Harbor Center will produce multiple economic and social benefits for the city of Buffalo and surrounding region. These benefits are immediate as well as long-term and are related to the magnitude of total investment in the project and the resultant level of use or attendance. The project will mean substantial construction activity, a considerable influx of visitors and associated spending, the ripple effect of these expenditures through the economy, and the spotlight of public attention. Based on attendance and financial parameters established previously in this report, this section examines the potential economic impact of the subject attraction. Again, all amounts are expressed in constant 1992 dollars and refer only to the recommended first-phase development.

OVERVIEW OF ECONOMIC IMPACT

A broad summary statement of the project's economic impact is set forth in Table 45. It should be noted that while certain components of estimated impact can be identified as fully captured by the city of Buffalo and/or Erie County, other benefits will be diffused throughout a regional area encompassing western New York and adjacent sections of Ontario, Canada; there will also be a moderate amount of leakage to areas beyond the Niagara Frontier region, representing the value of goods and services not available locally. As the table indicates, the total direct impact of the project varies from about $83 million as a downside projection to roughly $89 million on the upside. The mid-range performance scenario suggests a total direct impact on the order of $86 million.

This figure represents the sum of estimated construction costs, annual operating expenses, and potential new tourist spending in the region induced by development of the complex. When any new facility is developed in an area, the effect spreads well beyond the direct impact generated. Employees at the site, for example, spend their wages on a variety of goods and services offered...
Table 45

SUMMARY OF THE ECONOMIC IMPACT OF
BUFFALO HARBOR CENTER
( Constant 1992 Dollars)

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Construction Expenditures (one-time impact; in thousands) 1/</td>
<td>&lt;------------------- $68,125 -------------&gt;</td>
<td></td>
</tr>
<tr>
<td>Operating Expenditures (annual impact; in thousands) 1/ 2/</td>
<td>$6,929</td>
<td>$9,521</td>
</tr>
<tr>
<td>Off-Site Induced Tourist Expenditures (annual impact; in thousands) 1/ 3/</td>
<td>$8,250</td>
<td>$11,700</td>
</tr>
<tr>
<td>Total Direct Impact</td>
<td>$83,304</td>
<td>$89,346</td>
</tr>
<tr>
<td>Regional Multiplier</td>
<td>&lt;------------------ 2.0 -----------------&gt;</td>
<td></td>
</tr>
<tr>
<td>Total Output of Goods and Services Generated by Project (thousands) 1/</td>
<td>$166,608</td>
<td>$178,692</td>
</tr>
</tbody>
</table>

1/ Refers to Phase I program only.
2/ From Table 43.
3/ From Table 48.

Source: Harrison Price Company.
by businesses in the region, which in turn are paid out by these businesses to their own employees and to their suppliers, and so on in a continuous cycle. This repeated turnover, referred to as the multiplier effect, generates secondary benefits, which studies in the field suggest may range from 1.6 to 2.5 times the direct impact. An average multiplier of 2.0 has been used in this analysis, yielding a combined direct and indirect project impact of between $167 million and $179 million, with the mid-range estimate amounting to $172 million. The total economic value of the project, accordingly, is some two and one-half times the $68 million cost of development as estimated in separate planning reports by Cambridge Seven Associates.

SPECIFIC COMPONENTS OF IMPACT

Employment and payroll generation, expenditures on materials and supplies, induced visitor spending, and incremental tax revenues attributable to the project constitute the most prominent and readily measurable forms of impact. The paragraphs to follow describe each of these major benefits.

Employment and Payroll Generation

Table 46 presents an estimate of the number of new jobs and payroll created by the Buffalo Harbor Center attraction during both construction and ongoing operational periods. As indicated, direct employment generated during construction is estimated at approximately 1,100 jobs, representing $37.5 million in total payroll. When multiplier effects are taken into consideration, the employment impact doubles to almost 2,300 jobs and $75 million in payroll. During the operating period, the previous section of this report indicated that aggregate payroll would amount to a mid-range total of some $4.5 million per year. Allowing for a mixture of comparatively high-wage permanent staff and other personnel hired on a part-time or seasonal basis, an estimated weighted average annual salary of $22,000 (consistent with present experience at major aquariums) would result in a full-time equivalent of slightly more than 200 jobs on a mid-range basis. After applying the gross multiplier, total mid-range direct and indirect impact is estimated at more than 400 jobs and $8.9 million in payroll each year.
Table 46

EMployment Impact of Buffalo Harbor Center
(Constant 1992 Dollars)

<table>
<thead>
<tr>
<th>Construction Period (One-Time Impact)</th>
<th>Range</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Capital Cost (thousands)</td>
<td>&lt;------- $68,125 -------&gt;</td>
<td></td>
</tr>
<tr>
<td>Direct Payroll Generated (at 55 percent; in thousands)</td>
<td>&lt;------- $37,500 -------&gt;</td>
<td></td>
</tr>
<tr>
<td>Direct Employment Generated (at $33,000 per FTE job) 1/</td>
<td>&lt;------- 1,136 -------&gt;</td>
<td></td>
</tr>
<tr>
<td>Regional Multiplier</td>
<td>&lt;------- 2.0 -------&gt;</td>
<td></td>
</tr>
<tr>
<td>Total Direct and Indirect Payroll Generated (thousands)</td>
<td>&lt;------- $75,000 -------&gt;</td>
<td></td>
</tr>
<tr>
<td>Total Direct and Indirect FTE Employment Generated</td>
<td>&lt;------- 2,272 -------&gt;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating Period (Annual Impact)</th>
<th>Range</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Payroll Generated (thousands) 2/</td>
<td>$3,811</td>
<td>$5,327</td>
</tr>
<tr>
<td>Direct Employment Generated (at $22,000 per FTE job) 3/</td>
<td>173</td>
<td>238</td>
</tr>
<tr>
<td>Regional Multiplier</td>
<td>&lt;------- 2.0 -------&gt;</td>
<td></td>
</tr>
<tr>
<td>Total Direct and Indirect Payroll Generated (thousands)</td>
<td>$7,622</td>
<td>$10,654</td>
</tr>
<tr>
<td>Total Direct and Indirect FTE Employment Generated</td>
<td>346</td>
<td>476</td>
</tr>
</tbody>
</table>

FTE means full-time equivalent.

1/ Average annual wages or salary, including benefits, based on data from the U.S. Bureau of Economic Analysis.

2/ From Table 43; refers to Phase I program only.

3/ Average annual wages or salary, including benefits, based on comparable aquarium/museum experience.

Source: Harrison Price Company.
Purchases of Materials and Supplies

Another area in which Buffalo Harbor Center will have an appreciable impact is the purchase of various materials and supplies consumed in construction and operation. As indicated in Table 47, a projected 75 percent of the development budget, or $30.6 million, will probably represent materials purchases, an estimated 70 percent of which would be bought from local or regional suppliers. The resulting direct impact is more than $16 million, which increases to more than $32 million after allowing for indirect impact. The ongoing operating budget for the attraction was established earlier in this report at a mid-range $4.6 million per year exclusive of labor, of which some 60 percent, or $2.8 million, is estimated to represent outlays on maintenance, supplies including animal feed, and similar expenses. On the assumption that 75 percent of these expenditures are made locally, direct impact amounts to about $2.1 million annually for the mid-range performance assumption. Total direct and indirect impact is estimated at approximately $4.1 million per year, as shown.

New Visitor Spending Generated

There will be two major categories of visitor spending induced by the project. Firstly, new on-site expenditures on admission tickets, food and beverages, merchandise, and special event rentals will be generated by the project. Secondly, tourists attending the attraction will generate spillover benefits to merchants and service businesses in the region--such as gasoline stations, hotels or motels, restaurants, and retail stores--as an adjunct of their visit to the subject complex itself. The mid-range projection of total on-site visitor spending, highlighted in Table 48, is roughly $9.7 million, a sum which represents new money introduced into the economy that would not occur without development of the subject attraction. A multiplier has not been applied to this figure since the secondary benefits of on-site visitor spending have already been accounted for in payroll and materials purchases impact as described earlier.

With respect to off-site visitor spending, HPC has assumed that Buffalo Harbor Center will induce, on average, a modest gain of one-quarter day in tourist
Table 47

EXPENDITURES ON MATERIALS AND SUPPLIES
GENERATED BY BUFFALO HARBOR CENTER
(Constant 1992 Dollars)

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
<td>Estimate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Period (One-Time Impact)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Nonlabor Construction Cost (thousands)</td>
<td>$30,625</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Purchases of Materials and Supplies (at 75 percent; in thousands)</td>
<td>$23,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Proportion Purchased in Buffalo Region</td>
<td>70%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Direct Impact (thousands)</td>
<td>$16,100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional Multiplier</td>
<td>2.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Direct and Indirect Impact (thousands)</td>
<td>$32,200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Period (Annual Impact)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Nonlabor Operating Costs (thousands) 1/</td>
<td>$3,781</td>
<td>$5,652</td>
<td>$4,608</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Purchases of Materials and Supplies (at 60 percent; in thousands)</td>
<td>$2,269</td>
<td>$3,391</td>
<td>$2,765</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Proportion Purchased in Buffalo Region</td>
<td>75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Direct Impact (thousands) 2/</td>
<td>$1,702</td>
<td>$2,543</td>
<td>$2,074</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional Multiplier</td>
<td>2.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Direct and Indirect Impact (thousands)</td>
<td>$3,404</td>
<td>$5,086</td>
<td>$4,148</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1/ Derived from Tables 43 and 44; includes all nonlabor operating costs plus cost of goods sold.
2/ Refers to Phase I program only.

Source: Harrison Price Company.
Table 48

NEW VISITOR SPENDING INDUCED BY BUFFALO HARBOR CENTER
(Constant 1992 Dollars)

<table>
<thead>
<tr>
<th>Range</th>
<th>Low</th>
<th>High</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-Site Visitor Expenditures (thousands) 1/ 2/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admissions</td>
<td>$6,095</td>
<td>$8,604</td>
<td>$7,170</td>
</tr>
<tr>
<td>Food and Beverage</td>
<td>510</td>
<td>1,200</td>
<td>800</td>
</tr>
<tr>
<td>Merchandise</td>
<td>1,063</td>
<td>2,100</td>
<td>1,500</td>
</tr>
<tr>
<td>Special Events</td>
<td>125</td>
<td>250</td>
<td>200</td>
</tr>
<tr>
<td>Total Direct Impact</td>
<td>$7,793</td>
<td>$12,154</td>
<td>$9,670</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Off-Site Visitor Expenditures 2/</th>
<th>Estimated Annual Attendance Derived from Tourist Market (thousands) 3/</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>550</td>
<td>780</td>
<td>650</td>
<td></td>
</tr>
<tr>
<td>Estimated Additional Per Capita Expenditure in Buffalo Region 4/</td>
<td>&lt;------------------------&gt;</td>
<td>$15.00</td>
<td>&lt;------------------------&gt;</td>
<td></td>
</tr>
<tr>
<td>Total Direct Impact (thousands)</td>
<td>$8,250</td>
<td>$11,700</td>
<td>$9,750</td>
<td></td>
</tr>
<tr>
<td>Regional Multiplier</td>
<td>&lt;------------------------&gt;</td>
<td>2.0</td>
<td>&lt;------------------------&gt;</td>
<td></td>
</tr>
<tr>
<td>Total Direct and Indirect Impact (thousands)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$16,500</td>
<td>$23,400</td>
<td>$19,500</td>
<td></td>
</tr>
<tr>
<td>Combined On- and Off-Site Expenditures (thousands)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$24,293</td>
<td>$35,554</td>
<td>$29,170</td>
<td></td>
</tr>
</tbody>
</table>

1/ From Table 40; includes spending by both residents and tourists.
2/ Refers to Phase I program only.
3/ Derived from Table 23.
4/ Assumes an incremental gain in average tourist length of stay in the region of 1/4 day multiplied by an average daily per capita expenditure of $60.52 (0.25 days x $60.52 = $15.13).

Source: Harrison Price Company.
length of stay in the region. Based on spending rates discussed previously in this report (refer to Table 15), this increase in stay time translates into an induced per capita outlay of roughly $15 which, when multiplied by the expected number of tourists attending the attraction, yields total induced off-site spending of $9.8 million on a mid-range basis. After allowing for the regional multiplier, new off-site spending to be realized grows to $19.5 million mid-range. Aggregate on- and off-site visitor spending generated by Buffalo Harbor Center, including multiplier effects, comes to a mid-range total of $29.2 million.

Incremental Tax Revenues Generated

The final impact category to be addressed in this analysis is incremental retail sales and transient occupancy (hotel/motel) tax revenues generated by the project. Table 49 presents an estimate of total visitor spending subject to the retail sales tax, which includes all on-site spending except admissions (it has been assumed that as a nonprofit enterprise, admission tickets to Buffalo Harbor Center would be tax-exempt) and approximately two-thirds of all off-site spending (a portion of these expenditures going to nontaxable goods and services). In the aggregate, on- and off-site visitor spending on the order of $8.8 million would be subject to the retail sales tax under the mid-range performance scenario.

A total retail sales tax rate of 8 percent currently prevails in Buffalo, 4 percent of which goes to the state of New York, 3 percent to localities and school districts, and 1 percent to Erie County. As Table 50 indicates, these three entities will share some $707,000 annually in direct new retail sales tax revenue as a mid-range estimate. In addition, Erie County will realize another $298,000 per year in direct transient occupancy tax revenue given the projected increase in average tourist length of stay, the proportion of incremental spending associated with lodging, and the present 13 percent tax rate. After allowing for the regional multiplier, the mid-range projection, in summary, suggests a total direct and indirect tax increment (retail sales plus transient occupancy) amounting to more than $2 million per year.
Table 49

TAXABLE VISITOR EXPENDITURES GENERATED BY
BUFFALO HARBOR CENTER
(Constant 1992 Dollars)

<table>
<thead>
<tr>
<th>On-Site Visitor Expenditures Subject to Tax (thousands)</th>
<th>Range Low</th>
<th>Range High</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and Beverages</td>
<td>$510</td>
<td>$1,200</td>
<td>$800</td>
</tr>
<tr>
<td>Merchandise</td>
<td>1,063</td>
<td>2,100</td>
<td>1,500</td>
</tr>
<tr>
<td>Special Events</td>
<td>125</td>
<td>250</td>
<td>200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$1,698</td>
<td>$3,550</td>
<td>$2,500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Off-Site Visitor Expenditures 2/ 3/</th>
<th>Range Low</th>
<th>Range High</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Transportation</td>
<td>$932</td>
<td>$1,322</td>
<td>$1,102</td>
</tr>
<tr>
<td>Gasoline and Automotive Services</td>
<td>1,304</td>
<td>1,849</td>
<td>1,541</td>
</tr>
<tr>
<td>Lodging</td>
<td>1,939</td>
<td>2,750</td>
<td>2,291</td>
</tr>
<tr>
<td>Food and Beverages</td>
<td>2,739</td>
<td>3,884</td>
<td>3,237</td>
</tr>
<tr>
<td>Entertainment and Recreation</td>
<td>660</td>
<td>936</td>
<td>780</td>
</tr>
<tr>
<td>Retail Purchases</td>
<td>676</td>
<td>959</td>
<td>799</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$8,250</td>
<td>$11,700</td>
<td>$9,750</td>
</tr>
</tbody>
</table>

Estimated Proportion Subject to Tax                     | <----------65%----------> |

Off-Site Expenditures Subject to Tax (thousands)        | $5,363     | $7,605    | $6,338             |

Combined On- and Off-Site Expenditures Subject to Tax (thousands) | $7,061     | $11,155   | $8,838             |

1/ From Table 40; includes spending by both residents and tourists.
2/ Refers to Phase I program only.
3/ Estimated distribution of the $15 incremental off-site average tourist expenditure, based on data contained in Table 15.

Source: Harrison Price Company.
Table 50
INCREMENTAL TAX REVENUES GENERATED BY
BUFFALO HARBOR CENTER
(Constant 1992 Dollars)

<table>
<thead>
<tr>
<th>Range</th>
<th>Low</th>
<th>High</th>
<th>Mid-Range Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor Expenditures Subject to Tax (thousands) 1/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-Site Visitor Expenditures 2/</td>
<td>$1,698</td>
<td>$3,550</td>
<td>$2,500</td>
</tr>
<tr>
<td>Off-Site Tourist Expenditures</td>
<td>5,363</td>
<td>7,605</td>
<td>6,338</td>
</tr>
<tr>
<td>Total</td>
<td>$7,061</td>
<td>$11,155</td>
<td>$8,838</td>
</tr>
<tr>
<td>Direct Retail Sales Tax Revenue Generated (thousands)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State of New York (at 4 percent)</td>
<td>$282</td>
<td>$446</td>
<td>$354</td>
</tr>
<tr>
<td>Localities and School Districts (at 3 percent)</td>
<td>212</td>
<td>335</td>
<td>265</td>
</tr>
<tr>
<td>Erie County (at 1 percent)</td>
<td>71</td>
<td>112</td>
<td>88</td>
</tr>
<tr>
<td>Total</td>
<td>$565</td>
<td>$892</td>
<td>$707</td>
</tr>
<tr>
<td>Direct Hotel/Motel Tax Revenue Generated (at 13 percent; in thousands) 2/</td>
<td>$252</td>
<td>$358</td>
<td>$298</td>
</tr>
<tr>
<td>Total Direct Tax Impact</td>
<td>$817</td>
<td>$1,250</td>
<td>$1,005</td>
</tr>
<tr>
<td>Regional Multiplier</td>
<td>&lt;--------</td>
<td>2.0</td>
<td>&lt;--------</td>
</tr>
<tr>
<td>Total Direct and Indirect Tax Impact (thousands)</td>
<td>$1,634</td>
<td>$2,501</td>
<td>$2,010</td>
</tr>
</tbody>
</table>

1/ From Table 49; refers to Phase I program only.
2/ Includes spending by both residents and tourists.
3/ Based on estimated incremental lodging expenditures as shown in Table 49.

Source: Harrison Price Company.
Economic Impact Summary

The preceding analysis reveals that the Buffalo Harbor Center project will generate substantial economic benefits. As the attraction is expanded over time, these benefits will also grow. Equally significant, though not quantifiable, are the social benefits to be derived, including heightened community prestige resulting from the development of a high-quality destination attraction, augmentation of the local inventory of educational resources, provision of a means for increasing the appeal of downtown Buffalo to tourists and, most importantly, creation of a catalyst for the renaissance of a long-neglected and immensely valuable downtown waterfront.