Feasibility Study for a Science Center in Rockville, MD

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Executive Summary

The consultant team of Informal Learning Experiences and Museums+more evaluated the feasibility of a free-standing public science center located in Rockville and serving Montgomery County residents, students and visitors. The study includes a review of local and regional informal science education and activity opportunities, analysis of the demographics of Montgomery County, a survey of comparable institutions nationwide, and projections of the programs, operations and funding of the science center.

Rockville and Montgomery County are a highly-educated community with above-average incomes and an increasingly diverse population. The area is home to numerous government and private industry research facilities, a burgeoning technology-based business sector, excellent public and independent schools, and a substantial number of informal science learning organizations.

Analysis of the content emphases of the existing science learning opportunities leads to the conclusion that the Rockville science center focus on science and technology content which is unique or at least largely unique to the Rockville science center, deals with basic and applied science in everyday life, and has reference to the Research and Development community of the region, especially the technology corridor. The science center will provide additional resources for schools and families as well as activities for science-savvy and science-curious adults. There are good opportunities for partnerships with educational institutions, government agencies, businesses, community-based organizations and professional associations.

The well-established Maryland Science Center expresses strong interest in partnering with Rockville to develop the local science center. It brings abundant programming experience, a statewide prominence, and the possibility of providing administrative and support services. Feasibility of the Rockville science center likely depends on a relationship with the Maryland Science Center.

The Rockville science center can offer a wide range of programs for the general public, schools, youth, families, teachers and adults. There are numerous benefits, both social and economic, to the broad community.

The operating model of science centers involves a variety of funding sources for both capital development and general operating expenses. These include government (especially for capital), private contributions, earned income (admission and program fees, gift shop, etc.) and, to a lesser extent, endowment. The Rockville science center will follow this model.

The consultants recommend that, as a startup, the Rockville science center deliver programs in spaces already accessible to the public – e.g., schools, nature centers, libraries, etc. Ultimately it should plan for its own facility of about 20,000 square feet.

When fully developed the Rockville science center can anticipate a public attendance of 80,000 to 120,000 people, a staff of approximates 16 full-time positions plus part-time and volunteer staff, and an operating budget of about $1.5 million.

Determination of the site for the science center will take into account access, parking, impact on/synergy with neighbors, security, zoning, possible expansion, and cost. Several possible locations are considered. The current cost of a purpose-built building is as much as $7 million; renovation of existing space could be $1.5 million. Site acquisition and occupancy costs are additional.

The study includes an analysis of funding options and opportunities, including a fundraising process, construction and operational funding, and a brief assessment of potential funders – government, foundations, corporations, and individuals.

It concludes with next steps, starting with conversations with the Maryland Science Center.

Introduction

Purpose of Study

As stated in the Request for Proposal #55-04, this is a feasibility study, under contract with the City of Rockville, for the establishment of a science center/complex located within the corporate City limits of Rockville. This center/complex may include a museum and/or archival components. The study was performed in collaboration with a Task Force made up of citizens, representatives from the Rockville Consortium for Science, Inc. (RCS), representatives from organizations including local colleges and universities, public schools, non-profits, foundations, and area science-related corporations and City of Rockville staff.

Consultant Team

The consultant team retained by the City of Rockville to conduct this study was Informal Learning Experiences, Inc. and Museums+*more* LLC, both of Washington, DC. The firms' principals, Robert "Mac" West and David Ucko, led the study.

Process

Opening Charrette

The study began with a daylong charrette (a preliminary meeting involving stakeholders [citizens, planners, designers, etc.] to brainstorm or to elicit input on a project) on Saturday, October 30, 2004 at the Rockville Senior Center. Detailed notes and the consultants' presentation are posted on the City's web site www.Rockvillemd.gov/cip/sciencecenter; the notes are in Appendix A. This activity was an opportunity for more than 35 invited participants (see participant list in the appendix) to consider the purposes and roles of the proposed science center. They were asked to share their expectations for it, to define likely audiences, discuss content and presentation styles, suggest potential funding sources, offer thoughts about partners and community resources, implementation strategies, etc. These voluminous notes and comments provided a valuable resource for the consultants.

Key Informant Interviews

The consultant team met with Montgomery County Public Schools (MCPS) and Montgomery College educators, Rockville and Montgomery County officials, representatives of federal science agencies based in Montgomery County, local science education organizations and attractions, representatives of the tech businesses in the I-270 corridor, and individuals and organizations suggested in the charrette. These 29 key informant interviews inevitably led to additional resources for visits, interviews and conversations. The interviews are confidential, with no remarks attributed to any particular interviewee. Information and insights gained during these interviews inform the body of the study in many places. Appendix B contains a list of those interviewed.

Local Research and Site Visits

The consultants visited numerous sites relevant to this project in Montgomery County and the region (DC and Baltimore). Among those visited are Croydon Creek Nature Center, Audubon Naturalist Society (Woodend), Discovery Creek Children's Museum, Marian Koshland Science Museum, International Spy Museum, Maryland Science Center, National Museum of Health and Medicine, and the DeWitt Stetten Museum of Medical Research. Consultants have spoken with the developers of the Belmont Bay Science Center in Woodbridge, VA, the Executive Director of the Science Museum of Virginia, Richmond, and the former directors of COSI Columbus and COSI Toledo. The site visits often included tours of facilities, meetings with key staff, and gathering educational and program materials that define the specifics of the visitor experience at each place. The consultants also gathered statistical data (size, budget, staffing, etc.) to

help define each facility to the extent possible. Such information often is not available for sites that are nested inside governmental agencies.

National Comparables

The consultants have gathered key information (size, budget, staffing, programming) (Appendix C) for selected science centers in broadly comparable "edge" cities, since Rockville is an edge city within the Washington, DC area. This is a different list of cities than those listed in the RCS' proposal for a science center (September 2000) because the proximity to Washington and Baltimore provides a different set of circumstances than, for example, Ithaca, NY, home of the very successful Sciencenter. The consultants also gathered comparable information on science centers with total size of approximately 20,000 sq ft. (Appendix D). (This facility size is derived from the original science center profile posted on the Rockville Consortium for Science's web site and, at the conclusion of the study, is considered a reasonable size for the fully-developed the Rockville science center.)

Rockville Science Day

The consultant team attended Rockville Science Day (RSD) at Montgomery College on April 24, 2005. They interviewed visitors, asked about their reaction to RSD and also gathered their thoughts on the science center project. Those interviews are summarized in Appendix E. By and large, the concept of a local science center was well received and survey participants made numerous suggestions regarding potential content and focus. The consultants surveyed selected RSD exhibitor participants via email and phone; unfortunately, the response rate was low.

Figure 1. Robotics activity at Rockville Science Day, 2005.

RSD participant lists for the years 2000 – 2005 were compiled into a single master list (Appendix F) that shows what organizations and individuals have been regular participants in the program, and which have participated irregularly or infrequently. This is a helpful source of information on local interested parties, and potential contributors of time, money and materials. Over sixty organizations have participated over this six-

year period, with approximately thirty participating in each year. Nearly twenty have taken part in RSD five or six times, indicating the value they see in the event.

The most common participants over this period were representatives of public entities (City of Rockville, Montgomery County); Montgomery College; chapters of science-based organizations and local groups (e.g., Audubon Naturalist Society, Electric Vehicle Assn. of Greater Washington, Gem, Lapidary & Mineral Society of Montgomery County, Montgomery Amateur Radio Club, NARHAMS Model Rocket Club) and small businesses (Animal Exchange, Nature Education for Science Teachers & Students, Howtheweatherworks, MAGIC). There has been some participation by federal labs (e.g., NIST), research labs (e.g., TIGR) and corporations (e.g., Lockheed Martin Explorer Post). In addition, the American Association of University Women has used this occasion to present awards.

These organizations form a core group of supporters, both for programming activities and for potential contributions.

Ongoing Communication

As part of this planning process, the consultant team participated in and made presentations at regular meetings of the Task Force and met with or held conference calls with City staff. These occurred on January 18, February 10, February 12, March 23, April 4, April 25, September 7, September 21 October 7, 2005, and January 26 and February 16, 2006.

Background

Rockville Consortium for Science (RCS)

RCS was established as a not-for-profit 501(c)(3) in 1989. It is a small, grassroots organization with a passionate interest in science education. As stated on its web site (www.rocknet.org/Community/Science), "RCS acts at the local level to promote greater interaction between scientists and non-scientists to improve the quality of policy making in these areas. In addition, these interactions encourage students to take an interest in science and to pursue scientific careers. Goals: 1) to increase science literacy in the general public; 2) to encourage young people to develop and maintain their natural interest in science; 3) to help people understand the scientific principles underlying environmental concerns, technological development, and global systems; and 4) to establish a science center that will serve as an educational resource for the public."

As noted, the primary public activity of RCS is presenting the annual spring Rockville Science Day (RSD) at Montgomery College.

In December 2000, prior to the City of Rockville issuing the Request for Proposals that resulted in this feasibility study, the RCS developed a "Proposal to Establish a Science Center in the City of Rockville." This document is posted on the RCS web site. Various elements of that proposal have informed this study.

The importance of the RCS in moving the science center concept to its current position cannot be overstated. Its enthusiasm and passion for science education stimulated the city to undertake the current study. As the concept moves forward, the RCS should in some significant way continue to be part of the development process.

Regional Context

The Rockville science center would operate in a suburban environment between two major cities. In addition to the Smithsonian Institution with its various science attractions in Washington, DC, and northern Virginia, and the Maryland Science Center in Baltimore, there are a substantial number of other organizations, both stand-alone and parts of other organizations (school systems, federal agencies, nonprofits), which offer educational activities in various aspects of science. This study reviews their existing programs and offerings in order to determine what opportunities exist for the Rockville

science center, as well as what sorts of programming and audience partnerships and collaborations might be possible.

The following local resources are profiled in Appendix G:

Science Museums/Centers

Baltimore Museum of Industry, Baltimore, MD
Discovery Creek Children's Museum, Washington, DC & Glen Echo, MD
Explorers Hall, National Geographic Society, Washington, DC
Howard B. Owens Science Center, Lanham, MD
Lathrop E. Smith Environmental Education Center, Rockville, MD
Marian Koshland Science Museum, Washington, DC
Maryland Science Center, Baltimore, MD
National Children's Museum, Washington, DC

Nature Centers

Black Hill, Boyds; Brookside, Wheaton; Locust Grove, Bethesda; Meadowside (Rock Creek Regional Park), Rockville (all operated by Montgomery County)
Croydon Creek (operated by the City of Rockville)
Rock Creek Park (operated by the National Park Service).
Woodend Sanctuary, Audubon Naturalist Society, Chevy Chase, MD

Federal Agencies

National Institutes of Health, Bethesda, MD
    DeWitt Stetten Museum of Medical Research
    Office of Science Education
National Museum of Health and Medicine, Walter Reed campus, Washington, DC
National Institute of Standards and Technology, Gaithersburg & Rockville, MD
NASA Goddard Space Flight Center, Greenbelt, MD
U.S. Department of Energy, Germantown, MD

Smithsonian Institution

Science appears in various forms at the National Museum of Natural History, National Air and Space Museum (both on the National Mall and at the Udvar-Hazy Center in Virginia), National Museum of American History, National Zoo, National Arboretum, and National Botanical Garden.

As the national museum of the United States, the Smithsonian Institution, through its many museums, exhibits, programs, and research activities, takes a very broad view of American science and culture. It is not able to delve into and feature science and technology at a local or regional level. Further, none of the activities of the Smithsonian directly explore the science and technology that is the lifeblood of Rockville and Montgomery County. Thus, while the Smithsonian museums are magnificent, important, and nearby, they have very different missions. Thus, this study concentrates on smaller and more focused museums and centers, especially those in the Montgomery County region.

Environmental Scan

It is important that the Rockville science center planners be fully aware of the economic, social and educational environment in which the proposed science center would operate. Data available from the U.S. Census Bureau (Table 1) reveals several important aspects of the Montgomery County region. Of great importance, based on well-understood criteria by which participation in scientific, educational, and cultural activities is estimated, compared with national figures, the region (Montgomery County and five- and ten-mile rings around downtown Rockville) is affluent, well-educated, and increasingly ethnically diverse, with a remarkably high percentage of non-English speakers. The first two of these trends are highly positive indicators for science center participation; the third indicates a population that is growing at both the upper and lower ends of the socio-economic spectrum and becoming culturally more diverse.

Table 1. Population Characteristics of Montgomery County

	Montgomery County	Maryland	U.S.
Population, 2003 est.	918,909	5,508,909	290,809,777
Population under 18	25.40%	25.60%	25.70%
White persons	64.80%	64.00%	75.10%
Black persons	15.10%	27.90%	12.30%
Asian persons	11.30%	4.00%	3.60%
Hispanic persons (any race)	11.50%	4.30%	12.50%
Non-English spoken at home	31.60%	12.60%	17.90%
Bachelor's degree aged 25+	54.60%	31.40%	24.40%
Median household income	$71,551	$52,868	$41,994

Source: U.S. Census Bureau

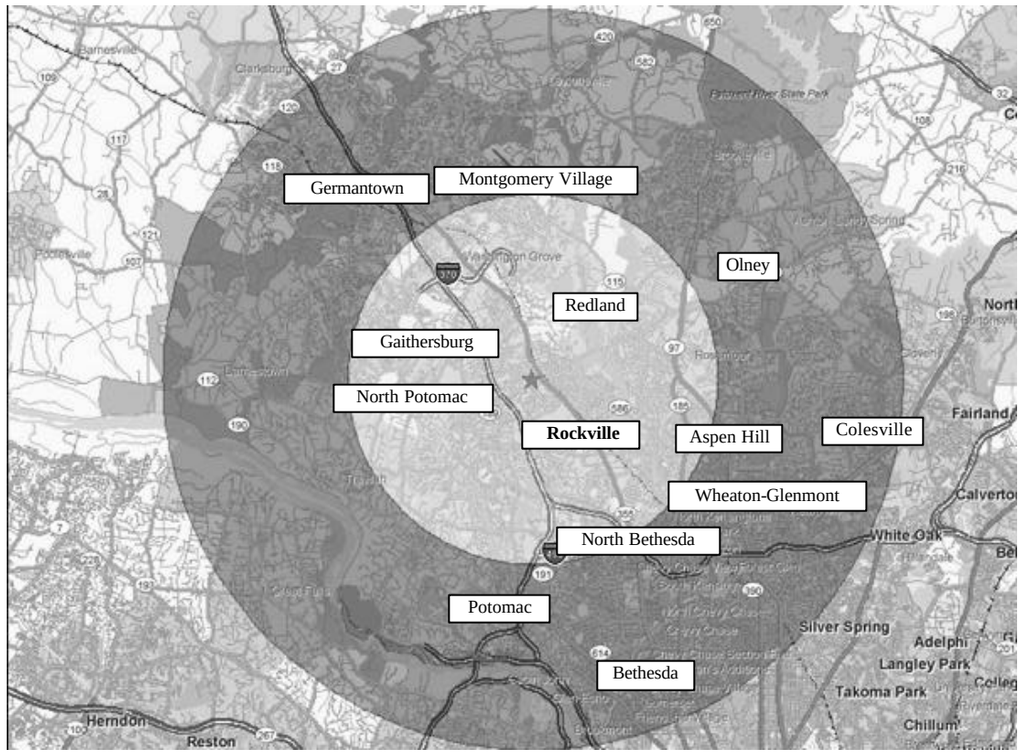
Demographics of 5- and-10 mile rings (Table 2 and Figure 1) around downtown Rockville (the primary service area for the science center) indicate that residents of more distant areas have slightly higher household incomes. However, when compared with Montgomery County as a whole, the immediate Rockville vicinity is economically well off.

Table 2. Population characteristics of 5- and 10-mile rings around Rockville

	0-5 mi	5-10 mi	Total
Population	285,527	574,351	859,878
Households	103,712	212,221	315,933
Ave. Household Size	2.5	2.5	2.5
White	173,270	358,936	532,206
Black	31,213	93,353	124,566
Native American	804	1,579	2,383
Asian/Pacific	45,995	64,271	110,226
Other	19,341	27,620	46,961
Hispanic Origin	45,521	66,179	111,700
Median HH Income	$85,111	$93,222	$90,000(e)
Population Ages 0-19	72,624	153,409	226,033
Median Age	37.7	37.1	37.3(e)

Source: Economics Research Associates; ESRI

Figure 2. 5- and 10-mile radii around downtown Rockville



National County Educational Ranking

The U.S. Census Bureau publishes county-by-county rankings of educational achievement, based on the proportion of residents over age 25 with graduate or professional degrees. As shown in Table 3, Montgomery County currently is at the absolute top of this list, and four of the top seven are in metropolitan Washington, DC.

Table 3. Educational level, top ten counties in the U.S.

POPULATION 25 YEARS AND OVER		
Counties	Graduate or professional degree	Rank
Montgomery County, Maryland	29.2%	1
Fairfax County, Virginia	28.1%	2
New York County, New York	25.7%	3
Howard County, Maryland	24.7%	4
Boulder County, Colorado	24.1%	5
Washtenaw County, Michigan	23.9%	6
District of Columbia, DC	23.6%	7
Westchester County, New York	23.5%	8
Middlesex County, Massachusetts	21.2%	9
Norfolk County, Massachusetts	19.7%	10
Source : U.S. Census Bureau, 2002 American Community Survey		

A final measure of the demographics of central Montgomery County and, thus, the likelihood of participation in the Rockville science center, is comparison of educational achievement for the 5- and 10-mile radii around downtown Rockville, shown in Table 4. Once again, the proportion of residents with college and advanced degrees far exceeds U.S. national averages. This is yet another predictor of the predisposition of Montgomery County residents to participate in the programs and activities of the Rockville science center.

Table 4. Educational achievement, 5- and 10-mile rings around Rockville

	0-5 miles	5-10 miles	U.S.
HS or less	26.8%	20.3%	46.2%
Some college	20.7%	20.6%	27.3%
Bachelor's	25.4%	28.8%	16.9%
Master's	15.1%	17.4%	9.7%
Ph.D. or Professional	12.1%	12.9%	

Source: Economics Research Associates

Recent Additions to the Cultural-Educational Resources of Montgomery Co.

As described in Appendix H, the Music Center at Strathmore, Kensington Antique Tour, AFI Silver Theater and Cultural Center in Silver Spring, and the Bethesda North Marriott Hotel & Conference Center have recently been completed; renovation of the Bethesda Theater (Nederlander) is under way. In light of these new major cultural embellishments to southern Montgomery County, the Rockville science center becomes another attraction that will not only serve as a resource for local residents, but also holds the potential for holding tourists and visitors in the Rockville area for longer times. As hotel and restaurant costs in downtown D.C. have gone up, increasing numbers of educational and budget tourists are staying in Montgomery County; the Rockville science center would be a natural additional attraction for them.

Strategic Niche

Occupied Niches

These are topics, contents, and approaches unwise for the Rockville science center to pursue because others already offer quality, popular programs, and educational experiences based on them.

The following are broad science and technology content areas which already are well represented in existing institutions, agencies, and attractions and readily accessible to the populations of greatest interest to the Rockville science center (those within a 25-mile radius of downtown Rockville).

Living, large, and exotic animals. The National Zoo has excellent displays of worldwide animal life and offers a full menu of educational programming. The Maryland (formerly Baltimore) Zoo has recently been refurbished, and the National Aquarium in Baltimore is superb, and recently opened a major expansion focused on Australia. The National Aquarium in DC (now a subsidiary of the National Aquarium in Baltimore) is a minor player in the living collection and environmental education arena.

Traditional natural and physical science. The Maryland Science Center (MSC) is a regional attraction and already reaches deep into Montgomery County through its outreach programming, as well as attracting very significant onsite visitation from Montgomery County. MSC recently added a major dinosaur gallery, which will be impossible for the Rockville science center to match. The Smithsonian's National Museum of Natural History is one of the world's great natural history museums, with stunning exhibitions and superb collections. Aspects of the physical sciences are covered in the National Air and Space Museum and the National Museum of American History.

Figure 3. Maryland Science Center, Baltimore

Nature and ecology. Numerous nature centers operated by the City of Rockville, MCPS, the Maryland-National Capital Park and Planning Commission, the National Park Service, and private organizations (e.g., the Audubon Naturalist Society) have nature trails, local ecology, plant and animal identification, etc. They are closely coordinated with the K-12 schools, offering grade-level programs, teacher enhancement, and soft adventure programming.

Aviation and space. The National Air and Space Museum is a very significant operation, with facilities on the National Mall as well as the new Udvar-Hazy Center in Dulles. VA; also there are smaller exhibitions at the College Park Aviation Museum and NASA Goddard Space Flight Center Visitor Center which also loans exhibits to museums and develops curricula.

Figure 4. NASA Goddard Space Flight Center Visitor Center, Greenbelt, MD

Medical science. The National Museum of Health and Medicine at Walter Reed has historical collections and offers a variety of public programs. However, the recent base-closing announcement by the Department of Defense proposes closing Walter Reed Army Medical Center and combining it with the National Naval Health Center in Bethesda. Thus far, the consultants have seen no speculation about the future of the National Museum of Health and Medicine in the event that this happens. In addition, the emerging independent National Health Museum has begun exhibit design and is making progress on securing a near-mall location in Washington, DC. The DeWitt Stetten, Jr. Museum of Medical Research at NIH has modest exhibition galleries and the NIH Office of Science Education offers on-campus programs, a Mini-Med School, and standards-based curricula and teacher resources on many aspects of health and medicine.

Available Niches

To help ensure its ultimate success, the Rockville science center should not be planned as a "cookie-cutter" science center. Rather, its planning should be based on carrying out its intended mission within the context of a region that already contains a large number of related museums and attractions that will compete for visitors and resources with any new institution.

In this regard, there are two approaches to consider as the program and facility requirements for the Rockville science center are developed. The first is a focus on science and technology content which is unique or at least largely unique to the Rockville science center, deals with basic and applied science in everyday life, and has reference to the Research and Development community of the region, especially the technology corridor. The second is to concentrate on this science education mission and not get diverted into maintaining collections or archives which are best done by others with that expertise.

These are topics, contents, and/or approaches not yet incorporated into any local centers and thus desirable for consideration for the Rockville science center.

Content Focus

From the perspective of content, the Rockville science center must be selective. As noted, there are many areas of science and technology already "covered" by other area museums. It should focus its resources on addressing a strategic niche that takes advantage of and builds upon the scientific and technical strengths of its community. Montgomery County is recognized worldwide for the biotechnology industry that grew from major federal research facilities, including the National Institutes of Health (NIH), Food and Drug Administration (FDA), National Institute of Standards and Technology (NIST), Walter Reed Army Institute of Research (WRAIR), and the Uniformed Services University of the Health Sciences (USUHS). Much of the growth began in the mid-1980s with research at NIH on genomics. The county is now home to over 200 biotech companies that employ over 12,000 people, along with twenty major federal research, development, and regulatory agencies, making it the fourth largest biotech community in the nation. As a result, the I-270 "Technology Corridor" is also known as "DNA Alley" and Rockville as the "home of the genome."

The most prominent of these is the complex developed by J. Craig Venter, who was part of the team that first sequenced the human genome. The new J. Craig Venter Institute (Venter Institute) continues the research and policy activities of the three merged institutes: The Center for the Advancement of Genomics (TCAG), the Institute for Biological Energy Alternatives (IBEA), and the J. Craig Venter Science Foundation Joint Technology Center (JTC). It also is acquiring archival collections. The Institute for Genetic Research is an affiliated research organization led by Claire M. Fraser, Ph.D. Both TIGR and the Venter Institute are supported by the J. Craig Venter Science Foundation (JCVSF).

These and other organizations may provide a wealth of resources, as addressed elsewhere in this report. Their presence establishes a community that is "attentive" to biotech, and may be interested in educating the public about this field. Reflecting these regional strengths and interests, the Rockville science center should focus strategically on the biosciences and biotechnology. This content emphasis does not mean that the Rockville science center must exclusively address these areas of science and technology. However, it does mean that they provide an entry point for engaging the public and school children in scientific research that is vital to their community and in many related areas, such as information technology, social and ethical issues, the underlying physical sciences, and the science behind our daily lives. These various aspects provide different "angles" to the biotech theme that can be tailored to the needs and interests of different audiences. In this way, biotech can provide a broad unifying principle and “filter” that will make the content presented by the Rockville science center highly relevant and meaningful to both residents and visitors to Montgomery County.

In addition, this niche provides an excellent complement to the topics currently presented by the Maryland Science Center (MSC) in Baltimore, whose exhibitions and programs emphasize earth system science (TerraLink, Dinosaur Mysteries, Fossil Quest, Follow the Blue Crab); space and astronomy (SpaceLink, Outer Space Place); health and the human body (BodyLink, Your Body); physics, forensics, and phenomena (Newton's Alley); and early childhood education (Kids Room).

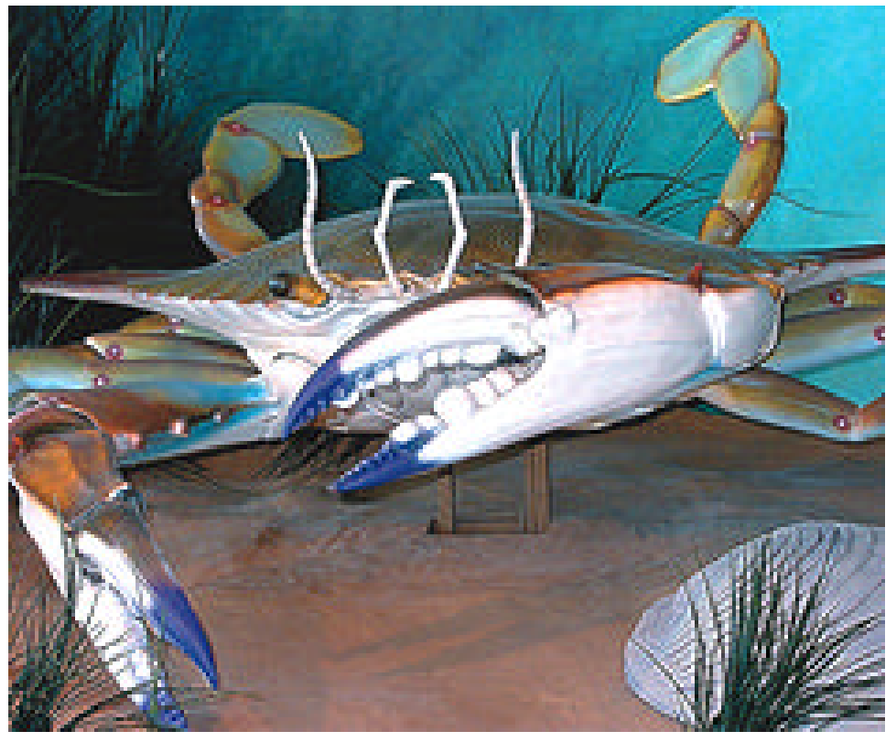


Figure 5. The mechanical crab in Maryland Science Center’s Follow the Blue Crab exhibition. This is one of the icons of the center.

Figure 6. Dial-A-Germ, or "call 111 to speak with a cold virus" in the My Body exhibition at the Maryland Science Center.

Of the local and regional institutions, organizations and attractions within a reasonable distance of Rockville only the Marian Koshland Science Museum actually deals in depth with aspects of the contemporary science and technology that serve as the basis for the research institutions and companies along the technology corridor. Its purpose is to serve as the public window on the studies carried out by the National Academies, the most prestigious of America's scientific organizations. While it is possible that the Koshland Science Museum will touch on biotech-related content, its current plan is to change the content of its temporary exhibitions on a regular basis.

Community Focus

Development of the Rockville science center must also be informed by the roles the institution can play that add value to different segments of the community in response to their particular needs and resources. In this way, the community focus adds another key dimension for selecting and shaping the Rockville science center's offerings for its target audiences.

The Rockville science center can also provide an important service to the residents, educators, and visitors to the area by "showcasing" the scientific research and contributions made by the biotech and related private and governmental entities in Montgomery County. In addition to the educational outcomes, the Rockville science center can deepen these organizations' involvement in the community by providing a productive outlet for volunteerism, in-kind support, and financial contributions. In addition, the Rockville science center can highlight possible career opportunities at a variety of levels, from engineer and Ph.D. scientist to technician and support staff. Doing so will give students a better appreciation of regional employment opportunities, motivate their studies in science and math, and help these organizations recruit the next generation of employees.

Furthermore, the Rockville science center can assist public and independent schools throughout Montgomery County by providing educational enrichment activities both at its facility and through outreach. Its proximity to local schools, compared to the distance required to travel to MSC or the Smithsonian, will make possible programs that require or benefit from more frequent participation, such as science projects and clubs.

As noted, the area is home to many science- and technology-based educational organizations that offer informal education. Local groups that lack their own facility

may welcome the chance to present programs to the public at the Rockville science center, similar to their once-a-year participation in Rockville Science Day. Depending on the facilities available, the science center may be able to offer space for these types of groups to meet. In addition, the Rockville science center can serve as a regional clearinghouse for identifying educational resources and referring families and children to them.

For adults in the community, the science center can provide more sophisticated opportunities for learning about scientific and technological developments and their potential impacts, along with social and ethical issues. Of course, it provides a nearby place to bring children and grandchildren for educational activities. The Rockville science center would offer opportunities for community service for those who are retired and anyone else who would like to volunteer, including both adults and older students.

These sets of content and community factors will help guide the development of the Rockville science center's programs and facilities by indicating those aspects that should be emphasized as the strategic focus for planning.

Intended Outcomes/Objectives

The Rockville science center must be extremely clear about whom it is seeking to reach and what services it intends to provide within a highly competitive environment.

Mission Statement

The mission statement should succinctly describe the purpose of the science center based on its strategic niche. Its mission statement provides the overall direction for the organization and should serve as a "filter," helping the organization focus on the programs and activities that best support implementation of the mission. The following is the proposed mission statement:

The Rockville science center (working name) serves the citizens and students of Rockville and Montgomery County by providing engaging educational experiences that build upon the bioscience and technology resources of the region.

Target Audiences

Traditional science center audiences are families with elementary and middle school-aged children, and schools' elementary and middle school science classes. The Montgomery County Public Schools alone had 139,337 students enrolled in 2004-05; 77,826 were in grades 1-8, the prime field trip grades. More are enrolled in parochial and independent schools and an increasing number are home-schooled.

Table 5. Composition of students in the Montgomery County Public Schools

2004-2005 Enrollment = 139,337								
	% Total	% Gender		% Racial/Ethnic Composition				
		Female	Male	Afr. Am	Am. Ind.	Asian	Hisp.	White
All Students		**48.5**	**51.5**	**22.6**	**0.3**	**14.4**	**19.4**	**43.3**
SPED	**11.9**	3.8	8.1	3.4	0.0	0.8	2.6	5.1
ESOL	**8.9**	4.2	4.8	1.2	0.0	2.0	5.0	0.7
FARMS	**23.7**	11.5	12.2	9.4	0.1	2.3	10.0	1.9

Source: Montgomery County public Schools
SPED = Special Education
ESOL = English as a Second Language
FARMS - Free and Reduced Meals

Table 6. Student Aptitude Test Scores

Average SAT Scores, 2003-2004		
	Montgomery County	National
Math	561	518
Verbal	541	508
Total	1102	1026

Local teachers already have a very substantive menu of science-related resources upon which to draw, both for field trips, for in-classroom programs, and for instructional resources. For example, refer to the MCPS web site at www.mcps.k12.md.us/curriculum/science/instr/fieldtrips/elemfieldtrips.htm.

Montgomery County Public Schools report that 76% of high school graduates plan to go on to college.

The most recent estimates from the Association of Science-Technology Centers (ASTC) suggest that, on the average, science center audiences are about one-third school groups and two-thirds general visitors, mostly families. The families that are attracted to science centers are primarily those with pre-adolescent children, and which fit the regional demographic of a well-educated population with discretionary income.

The Rockville science center, in view of its location in a science and technology-rich area, also should target science-savvy adult populations – practicing scientists, users of science in their homes and businesses, and the well-educated young adult population that is sensitive to the importance of science and technology in modern life. These groups traditionally have been difficult to attract to science centers, which, as an attraction genre, are stereotyped as being much more for children than for adults, especially childless adults.

Locally, the Koshland Science Museum has a successful early evening program (Pizza and Prose) for young professionals featuring science and technology "talent" in relatively unstructured discussion sessions; it draws heavily on Federal agency interns, Hill staffers, and would-be policy makers as its audience. Free pizza is a big attraction.

Strategic Programming and Funding Partnerships

Much of the success of the Rockville science center will depend on developing strategic partnerships with numerous other organizations. These partnerships will be with 1) selected users of and participants in the science center; 2) resource-rich organizations (professional organizations, non-profits and community-based organizations, businesses and corporations, foundations) which can provide intellectual resources to the science center, in-kind contributions of goods or services, and direct funding; 3) government agencies; and 4) other educational organizations, including pre-college and university education and other providers of science-based educational experiences. Many contacts with partners already exist through the years of work on Rockville Science Day. The following are presented as potential partners.

Educational institutions and organizations: MCPS, independent and parochial schools (54 in Montgomery County include upper elementary grades and higher), homeschoolers, Montgomery College, the Universities at Shady Grove, and the informal science organizations mentioned elsewhere in this report.

Government Agencies: Federal agencies (NIST, NASA, NIH, DOE, NOAA, USGS), appropriate State of Maryland agencies (especially Education), Montgomery County (e.g., Environmental Protection, Health and Human Services, Public Library, Public Works, and Parks and Recreation [Nature Centers]), City of Rockville (Recreation and Parks [Croydon Creek Nature Center]).

Corporations: BIOCON, Inc.; BioReliance Corp. (Invitrogen Bioservices), Celera Genomics (Applera Corp.); Discovery Communications, Inc.; Human Genome Sciences; MedImmune, Inc.; Fisher BioServices (Fisher Scientific); The Institute for Genomic Research (TIGR); Westat; see Funding Options and Opportunities for other possible corporate partners.

Not-for-profits/Community-based Organizations(CBOs): Hands-On Science Outreach; Boys and Girls Clubs of Greater Washington; Boy Scouts/Girl Scouts; Electric Vehicle Association of Greater Washington, DC; Gem, Lapidary & Mineral Society of Montgomery County; Henry M. Jackson Foundation for the Advancement of Military Medicine; Maryland Home Education Association; Maryland Public Television; Montgomery Area Science Fair Association; Montgomery County 4H; National Capital Area Skeptics; U.S. Pharmacopeia; Center for Advanced Research in Biophysics; and the Howard Hughes Medical Institute. Note: Rockville is home to 23% of the not-for-profit organizations incorporated in Maryland (Bethesda has most with 27%).

Professional Organizations: Montgomery County Science Teachers Association, NIH Alumni Association, and others (in addition to the regular exhibitors at Rockville Science Day).

Strategic Development and Operating Partnership

Success at the development and operations of the Rockville science center depends on the project achieving a level of visibility and credibility sufficient to attract both financial and political support. Even if the project starts with an interim facility, it will require substantial initial funding and the endorsement of elected officials at the City, and hopefully, at the County and State level. The consultants' experience with other startups (e.g., Science City in Kansas City. MO; the Marian Koshland Science Museum in Washington, DC; the Rocky Flats Cold War Museum, Arvada, CO; the Naples Depot, Naples, FL; Invention Factory, Trenton, NJ; Living Planet, Salt Lake City, UT; National Aviation Hall of Fame, Dayton, OH) strongly indicates the importance of these factors.

Evidence to date from the key informant interviews and other research suggests that association with a strong and reputable operating and funding partner for the proposed science center is essential for the project to be feasible. Most of those listed previously, while bringing important resources to the proposed science center, do not have skills, experience, or institutional interest in actually developing or providing operational support to the Rockville science center.

The Maryland Science Center (MSC) (www.mdsci.org) does have these resources and skills, as well as potential interest. During a fact-finding visit to MSC, the consultants met with MSC Executive Director Van Reiner to discuss possible relationships. He pointed out that Montgomery County already is a significant participant in MSC programming at several levels – teacher training, classroom field trips to the Science Center, outreach programs to Montgomery County Public Schools, and public visitation to the Science Center.

Further, at various occasions in the past, the MSC had considered establishing a presence in Montgomery County, but was lacking a relationship with a local science education partner. Now aware of the proposal to develop a science center in Rockville and of the seriousness of the City of Rockville evidenced by commissioning this feasibility study, MSC is very interested in the possibility of partnering with Rockville.

As noted in Available Niches, the emphases of the MSC do not include the current science and technology focus recommended for the Rockville science center. Thus, the Rockville science center would add an entirely new dimension to existing MSC programming, as well as to the other offerings available in the metro area.

The Maryland Science Center brings the Rockville initiative instant credibility in the informal science education world, virtually guarantees the attention of local political and

community leaders, and opens serious fundraising possibilities. MSC also has a library of credible programs which can be used either "as-is," or can be adapted to the content opportunities offered by the research institutes, R&D centers, institutions of higher education, and biotechnology businesses in the I-270 corridor.

In addition, MSC has fully-developed back-of-house capabilities (e.g., finance and accounting, human resources, exhibition development and fabrication, etc.), which could be available to Rockville, thus enabling a quicker startup in Rockville as well as significant ongoing operating savings.

The *quid pro quo* for MSC is that a Rockville partner strengthens its assertion to be a statewide science center, providing greater potential claim on significant state operating support than currently provided. Further, the location of Rockville in the high-tech part of the state gives MSC both additional visibility and potential access, along with the Rockville science center, to those intellectual and financial resources.

The consultants have investigated several existing partnerships between established and emerging science centers in order to provide models for how a Rockville-Baltimore partnership might evolve to mutual benefit. Two are described in Appendix I – the private Center of Science and Industry (COSI) in Ohio, in which COSI Columbus helped spawn COSI Toledo, and the state Science Museum of Virginia System, in which the Science Museum of Virginia in Richmond partners with regional science centers in Richmond, Danville, Bristol, and Harrisonburg, and is helping to establish the Belmont Bay Science Center on the Potomac River in Woodbridge. The COSI initiative has foundered, while the Virginia system is a series of carefully constructed partnerships, devised to ensure mutual benefits and supports, appropriate autonomy and local control of the emerging site, and clear local identity and programming. It is a model which should be closely examined by the Rockville science center.

Programs

At this feasibility stage, several program types can be identified, but it is not possible to indicate in detail what specific content should be included in each. The Rockville science center's programming must be guided by its mission and by strategic planning based on where resources can be applied most effectively and in a financially sound manner. Since fees can be charged for many programs, they can become a source of revenue, so long as expenses are controlled and budgets reflect actual costs of operations (including staff time and indirect costs).

Programming is the most flexible aspect of the proposed science center and provides creative opportunities for experimenting with ways to match the Rockville science center resources with the needs and interests of its various target audiences. It should take advantage of the extensive experience of the MSC, although the content may differ from their existing programs. The listing below is meant to be illustrative of potential science center programs but is not intended to be limiting. It further is suggestive of the science resources in the immediate area that can be engaged at the science center.

General Public. As part of its ongoing operations, the Rockville science center will likely offer the following types of programs for all visitors at certain times based on serving them as part of their visit and on attracting a paying audience. Although additional fees are sometimes charged, these programs are typically included with general admission.

Demonstrations. Scientific and engineering demonstrations offer opportunities for engaging the public and for sharing local resources, both in terms of volunteers and interesting research and development. They can be presented on a stage as at MSC or less formally within exhibit spaces. One variation on the demonstration program is "meet a scientist" in which visitors interact informally with a volunteer scientist or engineer who has a "prop" for explaining her work.

Special Events. They provide almost unlimited opportunity to highlight different aspects of science and engineering related to Montgomery County. Rockville Science Day is one obvious example. The science center should consider a mix of smaller-scale, themed, monthly events and a few larger events scheduled strategically throughout the year. There are various national "days" and "weeks" which can be the foci of special events (e.g., National Science and Technology Week).

Performances. This type of programming is less common. It may be possible for the science center to partner with one or more of the ~50 theater groups in Montgomery County to present informal or formal science-based pieces either on weekends or evenings. For example, the Science Museum of Virginia has a close collaboration with the Richmond Ballet for a youth initiative.

School Programs. Although these programs typically have fees attached, they are often subsidized, especially for schools with limited resources. Sometimes local businesses "sponsor" particular schools and pay for certain programs or provide bus transportation as contributions. School programs are supportive of the state and national science standards and assist teachers and schools in satisfying the requirements of the No Child Left Behind Act.

Organized homeschool groups often take advantage of programs initially developed for the schools. With the growth of homeschooling, this is in increasingly important audience.

Field trips. They are made most frequently by upper elementary and middle school classes, although increases in fuel costs and standardized testing have reduced the numbers. 30- to 50-minute age-appropriate programs are typically offered, closely tied to the curriculum and standardized test expectations for visiting class groups. The Rockville science center must be able to offer visiting groups experiences that are not possible in the classroom. MSC offers an extensive array of these types of "enrichment experiences."

Outreach. For schools that cannot visit or wish additional programs, outreach provides a way to bring science center programs into either classrooms or auditoriums. The MSC Traveling Science Program uses a van to transport staff and equipment throughout the state offering classroom, assembly, and StarLab (inflatable planetarium) programs. In addition to schools, the Rockville science center should consider delivering outreach programming to community centers, assisted-living facilities, and other sites that can reach different audiences. These programs should complement those offered by MdBioLab (www.mdbiolab.org), which provides weeklong laboratory investigations for students and teacher training in a custom tractor-trailer that visits Maryland high schools. In addition, the J. Craig Venter Institute will debut its Discovering Genomics mobile laboratory early in 2006. Numerous other outreach programs operate at varying scales.

Figure 7. The Starlab portable planetarium.

Figure 8. The MdBioLab mobile science laboratory. The Venter Institute begins to travel its mobile laboratory to DC schools in 2006.

Student/Youth Programs. This category includes the largest variety of potential programs, offering informal learning experiences after-school, evenings, on weekends, and during the summer or school breaks. Because these are not necessarily curriculum—linked, they are equally accessible to all youth, including homeschoolers, and provide quality time for teens. There will be opportunities for teens to earn service learning/community service credits at the science center, as well as add substance to their college admissions applications.

After-school programs. They can be carried out at the science center or they may take place at community centers or other settings led by science center staff or volunteers.

In addition to regular sessions, the Rockville science center should consider hosting Science Clubs, which can focus on areas of special interest. One direction to explore is Science Fair preparation, with local scientists working on projects with students at the science center using scientific equipment not available at school. Resources are available through the National Institute on Out-of-School Time (www.niost.org) and the Harvard Family Research Project Out-of-School-Time Learning and Development Project (www.gse.harvard.edu/hfrp/projects/afterschool/bibliography/science.html). These activities should be synergistic with existing after-school programs offered by the City of Rockville and others.

Weekend programs. Activities for targeted groups of all ages, such as girl or boy scouts working toward science or engineering badges, can be presented on weekends.

Summer camps. Week-long day camps can provide more intensive experiences during the summer and other holiday periods. In developing this type of programming, the Rockville science center should take advantage of the resources of the Center for Summer Learning at Johns Hopkins University (www.summerlearning.org).

Camp-ins. Based on the limitations likely for the first phases of the Rockville science center, this type of programming should be deferred. MSC offers camp-ins on Fridays and Saturdays for scout groups and others.

Competitions. The Rockville science center could create local competitions (building paper airplanes is a common science center example), or host national ones, such as the FIRST Robotics competition and LEGO League competition (www.usfirst.org).

Career Days. An annual event could be held to introduce youth and teens to the wide variety of careers available in the biosciences and technology. It would involve representatives of local companies and agencies, as well as partnership with like-minded groups such as Women in Bio (www.womeninbio.org).

Community service. The Rockville science center can provide opportunities for student interns or "explainers" who assist visitors. They are typically high-school students who volunteer, receive credit, or are paid, depending on the program. Some science centers, such as the New York Hall of Science, have created a "career ladder" designed to attract underrepresented groups into science careers by this mechanism.

Family Programs. These activities are designed for a child and parent, grandparent, or caregiver.

Workshops. Family workshops typically involve some form of "make and take" science-based activities in which child and parent work together on a project for an hour or more. A relevant example might be the "Saturday DNA!" program offered by the Dolan DNA Learning Center in Cold Spring Harbor, NY (www.dnalc.org), which is an operating unit of the Cold Spring Harbor Laboratory.

Birthday parties. This popular offering provides an educational experience along with the usual "goodies" for groups of young children accompanied by several adults.

Adult/Community Programs. This category is growing as science centers seek to expand their audience beyond families and children.

Lectures/Symposia. Leading bioscientists and others would likely be willing to speak at evening events, discussing their work.

Science Cafés. These more informal events can be organized where the public has the chance to meet with a scientist or engineer over refreshments and have a serious discussion of a current science topic.

Forums. Key issues with local or national consequences, such as the implications of the emerging field of nanotechnology, can be explored through public forums or even citizen consensus councils.

Community meeting space. Depending on its facility options, the Rockville science center may be able to offer science-based community groups meeting space in return for programming or volunteer services.

Facility rentals. In addition to providing an additional source of revenue, rental of the Rockville science center facility for evening events by outside groups enables adults to explore the science center in a social setting.

Teacher Programs. In addition to serving students, the science center can provide professional development programs for MCPS teachers.

In-service programs. The Rockville science center can assist the school district in providing training and a teaching laboratory for hands-on activities and inquiry-based constructivist learning, as well as informing them about the latest developments in science and technology along the I-270 corridor. MSC, for example, offers Teachers' Thursdays—Linking Educators with Current Science and specialized workshops, in addition to its Educator's Open House and Orientation in October. The type of program that the Rockville science center could offer is illustrated by the Museum of Science (Boston, MA) Symposium on Biotechnology Education (www.mos.org/doc/1584), an annual forum for middle school, high school, and community college educators.

Pre-service programs. The Rockville science center may also explore serving as a teaching laboratory for pre-service training through the University of Maryland College of Education (education.umd.edu/depts.html), the Maryland Collaborative for Teacher Preparation (www.towson.edu/csme/mctp/home.html), and the Montgomery College School of Education (www.montgomerycollege.edu/Departments/educatry).

Benefits

The proposed science center has the potential for having a positive effect on many aspects of life in Rockville and Montgomery County. A study carried out in 2001 by science centers in the U.S. and Europe examined the impact of science centers/museums on their surrounding communities (see www.astc.org/resource/case/Impact_Study02.pdf). It identified four types of impacts: personal, societal, political, and economic.

Personal impacts are the changes in those who participate in the activities of the science center; they include science-learning, changes in attitudes toward science, shared social experiences, stimulation of career interests, and personal enjoyment. They represent the intended impacts of achieving the proposed science center's educational mission on visitors, audiences served through outreach, and by professional development for teachers. There is a growing body of educational research that supports the educational impact of informal science education; see for example, Falk, John and Lynn Dierking, *Learning from Museums: Visitor Experiences and the Making of Meaning.* Walnut Creek, CA: AltaMira Press, 2000.

Societal impacts are the effects on organizations and groups of people, which may include increased tourism, improved quality of life, community partnerships, urban redevelopment, opportunities for volunteerism, youth employment, and others. Visiting cultural facilities, including science centers, has become a top driver of tourism; depending on the critical mass of its activities and relationships with other attractions, the proposed science center should increase the number of tourists who select Rockville as a place to visit. It will improve the quality of life in the region by providing a new community amenity and resource for the education and enjoyment of its families, adults, and school children. Afterschool and weekend programs for teenagers provide an important outlet as well as an opportunity for learning.

Partnerships, including the proposed relationship with MSC, are critical to the proposed center, as noted previously; they will enable programmatic, marketing, and operational synergies to be developed that benefit the organizations involved as well as the community at large. Science centers often play a role in the renewal or enhancement of a neighborhood; depending on its ultimate location, it certainly offers that potential. The proposed center will provide new opportunities for community service by students and other volunteers.

Political impacts may result at the local and regional levels. In many communities, science centers have favorably influenced government policies and priorities with regard to the creation and funding of programs and facilities for science education and research. The Rockville science center can help develop informed citizens who are better able to understand and take into account the scientific aspects of local issues.

Science centers and museums clearly have significant *economic impact* on their communities, as documented by many previous studies in the U.S. and abroad (see for example, www.aspacnet.org/apec/research/economic_impacts.html). Economic impacts result from visitor-generated revenue for the science center and for local businesses, expenditures by the science center, and job creation in the science center and community.

Another way to analyze the impact of the center is to examine its potential effects on particular segments of the community. MCPS will gain an educational resource that is readily accessible to its students and teachers, potentially reducing the need for more distant travel, such as to MSC in Baltimore or sites in Washington, DC. In addition, its proximity allows the possibility of programs that were not otherwise possible, such as student internships and teacher workshops. The proposed center will provide science-based activities that complement and enrich classroom learning, helping motivate students and improve performance.

Businesses in the region may benefit in ways that go beyond economic impact. Those engaged in biotechnology and related R&D may have a place to showcase their work through exhibits and programs. Given the proliferation of science and technology-based businesses, agencies and organizations in the region, it is important that the community both acknowledge their presence and also understand what it is that they do. The Rockville science center will provide a mechanism for strengthening their ties to the community through contributing staff volunteer time, artifacts, equipment, and other resources.

Operating *Pro-forma*

The Association of Science-Technology Centers (ASTC) gathers data on the various aspects of science center performance, organization and budgets. Below are ASTC figures for science centers in the "Very Small" and "Small" categories. These, plus the specific figures presented in Appendices C and D for 20,000 square foot science centers and "edge city" science centers, provide orders of magnitude estimates of the projected dimensions and budget of the Rockville science center. And, of course, the value of common services that may be provided by the Maryland Science Center may potentially significantly reduce administrative and support services expenses.

Table 5. Operating profiles of Very Small and Small science centers

	Very Small – 13,635 sq ft	Small - 44,000 sq ft
Interior Exhibit Space	6,000 sq ft	18,068 sq ft
Planetarium	22%	24%
Temporary Exhibit Space	1,100 sq ft	3,000 sq ft
Camps	61%	76%
Camp-Ins	32%	71%
After School Programs	54%	36%
Science Kits	41%	36%
Youth Employment	22%	26%
Senior Programs	15%	21%
Attendance	50,200	112,141
On-Site	48,590	99,140
Off-Site	5,137	12,992
Paid on-Site	40,374	56,840
Memberships	736	1,450
Employees FT	7	15
Employees PT	6	12
Personnel$/FTE	$30,368	$35,165
Volunteers	101	101
Operating Revenues	$596,530	$1,415,785
Funding Sources		
Earned	44%	49%
Public	20%	23%
Private	34%	22%
Endowment	1%	4%

	Very Small – 13,635 sq ft	Small - 44,000 sq ft
Admissions		
Adult	$5.00	$6.00
Child	$3.50	$4.00
Revenue from Admissions	$83,000	$215,000
Operating Expenses	$551,162	$1,354,218
Personnel	$329,985 (59%)	$825,000 (62%)
Advertising	$5,830	$41,000
Fundraising	$7,327	$43,263
Capital-New	$0	$52,987
Capital-renovation	$131	$27,247

Source - ASTC 2004

Science centers have several operating revenue sources; the consultants project that all will be part of the revenue mix for the Rockville science center. Current ASTC figures indicate that U.S. science centers (averages of all reporting institutions) have the operating revenue breakdown:

Earned income (admissions, sales, memberships, fees for services)	46%
Public funds (government sources – appropriations, line-items)	27%
Private/contributed funds (individuals, foundations, corporations)	26%
Endowment (sequestered investments)	3%

Naturally, these proportions vary substantially depending on local circumstances. However, as indicated above, most science centers rely heavily on the first three sources, while relatively few have endowments adequate to make significant (e.g., 10% or more) contributions to their operating budgets.

Typical admission fees to smaller science centers range from $5 to $8 for adults and $3.50 to $5 for children. Depending on the richness of the center's program, there may be additional fees for large-format theaters, simulators, special exhibitions, etc. The consultants do not foresee those revenue sources being available to the Rockville science center, at least initially.

Public funds are an essential part of the operating revenue for the majority of science centers. These funds come in many forms – annual appropriations from cities, counties and states; percentages of sales tax receipts for specified areas; mandated annual amounts; elements of the school system budget; governmental ownership; project grants; etc. The Rockville science center will have to work closely with the City of Rockville, Montgomery County, the Montgomery County Public Schools, and the State of Maryland to position itself as an essential service and thus a recipient of direct governmental funding. This discussion assumes that the science center will be organized as a 501(c)(3) not-for-profit organization that forms a public-private partnership with some combination of City, County, and State support. Preliminary conversations suggest that it is unlikely that either the Montgomery County Public Schools or Montgomery College is interested in providing any basic operating (or capital) funds.

Private contributions also are essential to science centers. These come in the form of annual philanthropic gifts from individuals, corporations and foundations; specific program support such as a named lecture series, exhibition sponsorship, and sponsorship of a student initiative; planned giving; bequests; and in-kind giving in the form of equipment, materials or services. The role of the private sector funding is discussed further in the section titled Funding Options and Opportunities.

Endowments tend to develop either from the largess of a founder (e.g., Carnegie Institute in Pittsburgh, The Field Museum in Chicago, the Phillips Collection in Washington, DC, and The Henry Ford in Dearborn, MI) or from a careful and systematic community campaign to build a base of financial sustainability for a beloved

local organization. The consultants suggest that the Rockville science center not anticipate having endowment funds of any magnitude until it is well established.

In order to develop both capital and operating budgets, it is necessary to determine both the facility and staffing requirements, make estimates of attendance and various earned revenue centers, and assess the opportunities for contributed revenue from both public and private sources.

Facility Design and Requirements

The following space allocation is a hypothetical construct for the purposes of developing the feasibility study *pro-forma* for an independent non-profit organization. Fuller determination of both the details of the program and the possible relationship with the Maryland Science Center could significantly alter these projections.

Having reviewed the size and functions of numerous science centers, and placing all of this information in the context of Rockville and Montgomery County, the consultants concur with the initial suggestions of the Rockville Consortium for Science that about 20,000 total square feet is a reasonable place to start calculations on the permanent facilities, capital cost, and base operating budget of the Rockville science center. Thus, the following facilities model is based on that initial assumption.

Program Space Needs – 15,000 sq ft. These are areas which are accessible to the participating public, whether they be using the exhibitions or participating in a structured or after-hours program.

40% of the total square footage will be devoted to public exhibitions with demonstration spaces, totaling 8,000 sq ft. Part of this (up to 2,000 sq ft) might be devoted to changing and traveling exhibitions. It will be best of the exhibition space is flexible, allowing different mission-related topics to be presented at different times with relatively modest change-out costs. Each exhibition topic area should have the ability to support some sort of group presentation/ demonstration function in addition to exhibition use.

There must be modest program materials storage incorporated into the exhibition /demonstration area. It is important that floor educators have ready access to their program materials without having to rely upon back-of-house storage.

15% will be devoted to learning center(s), totaling 3,000 sq ft. These are NOT classrooms, but rather are themed areas which facilitate inquiry-based learning, are themed and less formal than classrooms, but will accommodate a full school class. They are convertible to non-school group use as well as after-hours functions. When not in use for formal programs (e.g., on weekends), the theming and activities are strong enough for these to be regarded as part of the general public's experience.

5%, or about 1,000 sq ft, will be devoted to a multipurpose/assembly room which is a flat-floor, flexible-seating room, fully equipped with projection equipment, internet access, etc. At about 7 sq ft per seat, it will seat 140-150 people and can be subdivided for small meetings and programs.

10% (2,000 sq ft) will be devoted to public amenities and orientation. These include public rest rooms, coatroom/lunch storage, vending machines, modest retail, and admissions/information/marshalling. These all are entry functions which will share some spaces, but it is important to devote adequate space to the arrival experience.

5% or 1,000 sq ft is allocated to general circulation space. This is unallocated space which simply is required in order to make a public facility work. It includes hallways, transition zones, lobbies, etc., all of which are essential to a quality visitor experience.

The entire facility, public as well as staff, will be fully WiFi enabled.

If possible, depending on the ultimate location of the Rockville science center, there will be outdoor program spaces, ADA accessible and available for use during the warmer months. Depending on how these are placed and structured, they will provide opportunities for varied programs and public events.

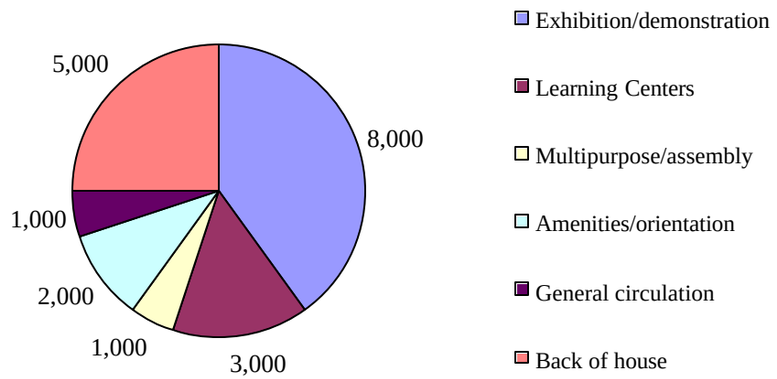
There is some interest on the part of community-based hobbyist and amateur science organizations to have permanent homes in the Rockville science center. Those spaces are not included in this space plan but, if there is appropriate interest and a suitable degree of mutual advantage, it is advisable for the science center to consider how it can use its space to assist those community-based organizations. Providing these spaces would be more likely if the Rockville science center were to occupy an existing building that could not be fully occupied, at least initially. It would not be cost-effective to build out such space as new construction.

Back of House Space Needs – 25% - 5,000 sq ft. Approximately half of this space will be used for staff offices and work stations. Adjacent areas will be used for supplies storage, outreach materials storage and assembly, staff/volunteer lounge w/coat & lunch storage, education storage, exhibition repair/maintenance shop and janitorial/housekeeping facilities. A catering/staff kitchen must have easy access to the public spaces. Space also will be devoted to basic building mechanical functions - HVAC, water, sewage, electrical, etc.

Exterior facility requirements include outreach vehicle parking and loading, a loading dock entrance and dock with access to the public spaces, and staff parking. The location of the science center facility should take into account proximity to Metro, bus access, and public parking options.

Design and construction of the facility should be environmentally sensitive to the extent possible.

Figure 9. Suggested functional allocation of 20,000 square feet.



Basic assumptions for this set of facility requirements include:

- No planetarium/domed theater
- Exhibits are designed and fabricated off-site
- The Rockville science center is a non-collecting institution
- Housekeeping and janitorial services [and potentially security] are outsourced
- There is no food service beyond vending machines
- There is a significant reliance on volunteers
- Overall staffing requirements are dependent on the possible relationship with the Maryland Science Center and thus lower than typical for size

Staff Plan

Assumptions: stand-alone, non-profit organization, focused exclusively on science experience and education; 6 to 7 day operating week with frequent evening programs and events; outsourced contracting for accounting, legal, housekeeping, janitorial, security, and major maintenance services.

Administration
- Executive Director
- Administrative Assistant/Receptionist

Development/Public Relations
- Director of Development/PR
- Development/PR Assistant

Programs
- Education Director
- 2 FT Educators/Demonstrators
- 4-8 PT Educators
- Webmaster/Online Resource Coordinator
- Community Coordinator
- Outreach Specialist
- Exhibitions Coordinator/Manager
- Exhibitions Assistant

Operations
- Operations Director
- Bookkeeper
- Building Manager
- Visitor Services Manager
- Visitor Services Staff – 6 PT

= 16 FTE, 10-14 PT, volunteers

This example of a possible staffing plan is based on data from existing stand-alone science centers with the added assumption that accounting, personnel (including payroll and benefits), some fundraising, exhibition development, fabrication and installation, marketing, and some government relations are handled all or in part by MSC. Actual staffing may be higher or lower, depending on the scope of exhibits and programs that is implemented, as well as any agreement with MSC. It should be noted that projected staffing is significantly higher than the level for City of Rockville-operated facilities, which benefit from in-kind contributed services from the City and have different programmatic and operational needs and expectations.

Attendance

Attendance projections are based on a combination of the performance of generally comparable institutions in similar environments and consideration of the demographic, economic and political circumstances of the location of the proposed facility. Data presented in this report describes small science centers in cities around the U.S. as well as industry standards reported by the American Association of Museums and the Association of Science-Technology Centers.

Tables 1- 4 above and Table 6 below present the circumstances of Montgomery County and the region centered on Rockville. These demographics are favorable to the Rockville science center – well above-average educational levels and family incomes.

Table 6. Regional population (CMSA = Consolidated Metropolitan Statistical Area; PMSA = Primary Metropolitan Statistical Area).

Area	Population
Washington-Baltimore, DC-MD-VA-WV CMSA	7,608,070
Baltimore, MD PMSA	2,552,994
Hagerstown, MD PMSA	131,923
Washington, DC-MD-VA-WV PMSA	4,923,153

Source: U.S. Census 2000

This is a densely-populated area. Montgomery County has a population of about 920,000; 285,000 people live within five miles of downtown Rockville and 860,000 residents live within the ten-mile circle around Rockville. The metropolitan area is so large, and there are so many national-level educational attractions within a 1-2 hour trip of most residents, that the consultants chose to use the 10-mile radius around Rockville as the primary population for attendance calculation purposes. Because the particular array of exhibitions, experiences, and presentation styles cannot be selected until later in the planning process, the attendance projection is based on a penetration rate of this limited population.

Penetration rate is a calculation of the total attendance at a facility as a percentage of its region, usually its Metropolitan Statistical Area. The penetration rates of the 20,000 and 40,000 sq ft science museums in Appendices C and D range from 1% (suburban Chicago) to 53% (Asheville, NC). With outliers eliminated, the penetration rate ranges from 2% to 43%. The average for 20,000 sq ft museums is 27%; for 40,000 sq ft museums, 13%. Low figures of 10% to 15% penetration of the 10-mile Rockville radius were selected in order to stay on the conservative side; they project a total annual attendance for the Rockville science center of between 80,000 and 120,000. Attendance from beyond that radius, including tourists, is not included in this figure.

Based on the array of programs and experiences currently under consideration, admissions attendance is segmented as follows:

Audience	Per Cent	Low	High
School Groups	30%	24,000	36,000
Families	60%	28,000	72,000
Adults	30%	24,000	36,000
Children	30%	24,000	36,000
Programs	10%	8,000	12,000
Total	100%	80,000	120,000

Of these admissions, at least 15% will be “members and complimentary,” reflecting anticipated member benefits, promotional discounts, and complimentary attendance. School groups will pay a lower *per capita* admission fee than regular visitors.

The 10% to 15% penetration rate for the 10-mile radius around Rockville is projected with the expectation that the content presented by the museum, reflective of the science and technology businesses, industries, and agencies of the I-270 corridor and the Maryland suburbs of Washington, is substantially distinct from the programming offered by any of the region’s competitive organizations. Thus, the Rockville science center will have a product which can truly be marketed as one-of-a-kind, which serves a unique role for the Montgomery County Public Schools, and which is the only place in the region for students, teachers, families, science-savvy adults, and the broad public to experience and understand the science and technology that are part and parcel of the region’s intellectual economy.

Location of the Rockville science center in or near Rockville Town Center, with easy Metro access, will enhance its ability to attract a strong attendance. Likewise, the availability of dedicated parking and a prominent presence will be essential. Most of all, development of a regional "brand" and an adequate marketing budget are important in producing the anticipated attendance.

Operating Revenues and Expenses

Table 7. Attendance and Revenue Calculation

Attendance and Revenue Calculation						
			Lower		Higher	
$5.00	Adults	30%	24,000	$120,000	36,000	$180,000
$3.50	Children	30%	24,000	$84,000	36,000	$126,000
$2.00	School Groups	30%	24,000	$48,000	36,000	$72,000
$6.00	Programs	10%	8,000	$48,000	12,000	$72,000
				$300,000		$450,000
Less 15% member, unpaid, promotional				$45,000		$675,000
Total attendance and revenue			80,000	$255,000	120,000	$382,000

Estimated Salaries

Executive Director	$65,000
Administrative Assistant/Receptionist	$35,000
Director of Development/PR	$45,000
Development/PR Assistant	$30,000
Education Director	$45,000
2 FT Educators/Demonstrators	$60,000
Resource Room/IT Coordinator	$35,000
4-8 PT Educators	$48,000
Community Coordinator	$30,000
Outreach Specialist	$30,000
Exhibitions Coordinator/Manager	$40,000
Exhibitions Assistant	$25,000
Operations Director	$45,000
Bookkeeper	$30,000
Building Manager	$40,000
Visitor Services Manager	$35,000
6 PT Visitor Services Clerks	$60,000
	$698,000

Projected Revenues

Earned	Admissions		See Chart; midpt	$318,750
	Merchandise	$2.00	Per attendee	$200,000
	Vending	$0.50	Per attendee	$50,000
	Facility rentals	$500	60	$30,000
	Memberships	$80	1,000	$80,000
Subtotal				$678,750 45%
Unearned	City of Rockville		estimate	$250,000
	Montgomery County		estimate	$250,000 33%
	Contributed		estimate	$328,000 22%
Subtotal				$833,000
Total Revenues				$1,506,750

Projected Expenses

Labor	Professional	16 + 12	FT + PT	$698,000
	Benefits	25%		$173,250
Subtotal				$871,250 58%
	Vending CoGS*	50%	Vending revenue	$25,000
	Merchandise CoGS	50%	Merchandise revenue	$100,000
	Exhibit Expense		Special/upgrades	$100,000
	Operations/Insurance	$4.50	Per SF	$90,000
	Maintenance	$0.60	Per SF	$12,000
	Professional services	3%	Revenue	$20,000
	Advertising	$1.10	Per attendee	$110,000
	Membership	80%	Membership revenue	$60,000
	Supplies	$2,000	Per FT	$36,000
	Travel	$500	Per FT	$9,000
	Development	$0.40	Per attendee	$40,000
	Contingency	5%	Revenue	$33,500
Subtotal				$635,500 42%
Total				$1,506,750

*CoGS = Cost of Goods Sold

Note that these revenue estimates closely track the ASTC percentages previously indicated.

It should be kept in mind that these preliminary projections will need to be modified and refined as the facility and programmatic plans for the Rockville science center are developed in further detail in partnership with MSC.

Rockville Science Center Site Study

Site Requirements

The Rockville science center must take the following characteristics into account when analyzing potential sites for a temporary or permanent facility. Most of these factors are based on the Rockville science center becoming a destination attraction that draws visitors to its facility based on the attractiveness of activities as well as its location.

Access. The Rockville science center should be centrally located based on the geography of its target audiences. It should be convenient for visitors to get to the Rockville science center, both by car and by public transportation, if at all possible. The greater the "hassle" factor, the less likely that people will visit.

Parking. The Rockville science center parking should be adequate, convenient to the building, and preferably free. An approximate rule of thumb is one space per 1,000 annual visitors. Based on this rule of thumb, 80 to 120 spaces are required. Because certain days of the year have attendance peaks, capacity for overflow parking is a valuable asset.

Neighbors. The Rockville science center should ideally be located near other facilities that draw similar audiences, creating a "critical mass" of attractions that will help justify

the time and effort for making a visit. This feature is important for the Rockville science center since it will likely start as a relatively small operation. It also supports the notion that has been suggested of creating a science center "complex." These synergistic activities would be best left to other organizations dedicated to such ancillary purposes, allowing the new science center to maintain a sharp focus on its mission. On the other hand, certain types of neighbors can compete for parking or be undesirable for other reasons.

Security. Perception of safety by visitors is vital, especially for families with young children and for activities that take place after dark, such as facility rental and evening programs.

Image. The facility will shape the public image of the Rockville science center and should be readily identifiable as the science center's home. The Rockville science center building should be recognizable from a distance if possible.

Expansion. Capability for long-term expansion is essential, especially for a permanent facility. If the Rockville science center is successful, it will outgrow its facility over time and must have room on the site to expand.

Zoning. Zoning or other restrictions must not limit the types of uses contemplated by the Rockville science center. For example, some museums have faced significant operating problems because of limitations on parking in residential neighborhoods.

Costs. This factor is most important for a permanent facility, especially new construction. However, even for adaptive reuse, site factors such as environmental contamination, can greatly increase costs. Nonetheless, it is important that the science center be, to the extent possible, constructed and operated in an environmentally-sensitive and energy-efficient fashion. Further, and again with cost as a consideration, it should have architectural and physical presence.

The Rockville science center also should begin thinking about the following types of building functions when planning its science center facility. During initial facility planning, an architect would develop a "program" based on the size requirements and adjacencies of functions.

- Approach and entrance
- Reception and orientation
- Washrooms
- Connecting spaces
- Education facilities
- Demonstration spaces
- Exhibit spaces
- Temporary exhibition spaces
- Exhibit support
- Theater(s)
- Gift shop
- Food service
- Assembly spaces
- Meeting rooms
- Staff and volunteer offices
- Storage
- Building services

Site Identification and Selection

The consultants recommend that the Rockville science center pursue a phased development strategy. The first two phases can be carried out in parallel in collaboration with MSC.

1. *Existing distributed spaces.* Start with programs offered by MSC using existing community spaces. These educational programs will begin to establish a presence for the Rockville science center, provide audience feedback to inform further program development, and build support for the next phases.

Potential sites: Spaces currently used for the City of Rockville recreation programs (e.g., school classrooms, community centers, Rockville Senior Center, Croydon Creek Nature Center)

2. *Temporary or interim facility.* Explore dedicated site options for an interim facility that will provide the first "home" to the Rockville science center. The size of this space should be determined in concert with MSC; it would likely be 10,000 sq ft or less, depending on whether exhibits will be included as part of this phase and the types and frequency of programs offered. Preferably, this space would be donated by a government entity, a landlord seeking to generate traffic, or a developer wishing to obtain a favorable zoning variance. We do not recommend leasing space at market rate, since the Rockville science center operation will not likely generate sufficient excess revenue over expenses in this phase.

Potential sites: City or County building; Commercial retail space; tech corridor bioscience or technology corporate building.

3. *Permanent facility.* Work toward identifying, achieving community consensus, and raising capital funding for a permanent facility. This phase can take many years of persistent effort. It can become drawn out, and even contentious, if various constituencies support different permanent sites for parochial reasons, as is often the case. This is one of the reasons that temporary facilities are recommended for the initial phases of the Rockville science center.

The prospect of building a new facility on vacant property seems especially unlikely in the near-term. The cost of purchasing real estate in the area is extremely high (e.g., Town Center at ~$5 million/acre) and new construction is approaching $200/sq ft. More likely is the adaptive reuse of an existing facility, which is quite common for science centers and museums, in part because community support can be more readily galvanized when the project can accomplish multiple public purposes.

During site discussions, several properties have been suggested.

King Farm. On Frederick Road at the northern edge of Rockville, this 200-year old 430-acre farmstead is now a large mixed-use development. The city-owned barns on the property have potential for conversion to science center facilities. The strengths of this site include re-use of buildings with character, local history that can interpreted as a foundation for today's Rockville and regional biotech industry, potential support from historic preservation groups, and convenient access by car or metro. In addition to the likely high cost of renovation, challenges of this site include minimizing visitor impact on the nearby residents, who may balk at an expected increase in traffic and parking.

Lone Oak Elementary School. Located at 1010 Grandin Avenue in East Rockville, this former public school could be considered. However, the building currently houses the year-round, NAEYC-accredited Park Street Children's Center, part of the Montgomery County Childcare Association.

Lincoln High School. Located in East Rockville at 595 Stone Street, is the oldest remaining high school constructed for black students in Montgomery County. It is excluded as a possible site because it currently serves as home for the Crusaders Baptist Church and United Black Cultural Center.

Montgomery College. A new science building is being constructed for the College, but already is filled to capacity and cannot be considered for that reason.

Construction/Capital Costs

It is very difficult to project capital costs for construction, whether it be renovation of an existing building or new construction. On the whole, however, the cost of renovation tends to be significantly less than that of new construction, especially if signature architecture is specified. The suggestion in this study is that the science center start out sharing other organizations' facilities, and gradually, as it develops a presence in the community, move toward its own space.

Looking to that time when the science center is in dedicated, fully-owned or leased space, the cost of a 20,000 square foot new building might be in the range of $7,000,000, and equivalent amount of renovated space in the range of $1,500,000. These calculations, derived from the data in Table 8, do not include site acquisition or occupancy costs.

Table 8. Construction costs.

	New Bldg. Median	Expansion Median	Renovation Median
Children's Museum	$275/sq ft	$172/sq ft	$130/sq ft
General Museum	$280/sq ft	$357/sq ft	$75.35/sq ft
Sci-Tech Center	$364/sq ft	$214/sq ft	$74.06/sq ft

Source: AAM 2003 Museum Financial Information

Since the AAM data is several years old, these figures almost certainly under-represent actual costs in dollars per square foot in the current construction market.

Cost of Exhibitions

The Rockville science center's exhibitions should be both physically and intellectually engaging, a combination of specially-designed educational resources that represent the research and development currently occurring in the I-270 corridor region and relatively standard interactive units that demonstrate basic underlying scientific principles.

Interactive exhibits, regardless of the topic being explored, cost more than do the same area or volume of static presentations. A recent study of real costs of development and production of interactive exhibits (West 2004) revealed that they cost about twice as much as static exhibits, or $300 to $700 per sq ft. Thus, if the entire proposed exhibition area of 8,000 sq ft is developed at a lower-price interactive level ($300 –$400/sq ft), the initial investment will be about $2,400,000 - $3,200,000. This expense represents the biggest single capital cost; it will vary depending on how much of the exhibitions are permanent, as well as what might be provided directly by the Maryland Science Center.

Funding Options and Opportunities

Note: The section of the report that follows is not intended to be a formal fundraising feasibility study for the Rockville science center. Rather, it presents an overview of the process the Rockville science center should follow, identifies potential sources of funding, and identifies key issues that must be addressed to support both a capital campaign and operations long-term. It should be noted that Phase Three of the RFP called for consultant meetings with representatives from prospective funding sources. Given the potential relationship with MSC, these discussions should take place only after approval of the concept and general plan, and should involve representatives of MSC, the City and others either may designate, or at a minimum, be based upon a jointly agreed-upon plan and framework. Because the MSC relationship is currently at a sensitive exploratory stage, any donor discussions at this point were deemed premature.

However, Phase One and Two meetings (Appendix B) included prospective donors who informed this phase of the study.

Fundraising Process and Issues

Fundraising for the Rockville science center, like any cause, is a process whose success depends on the following critical factors:

Perceived importance of the cause. The Rockville science center cause must address a perceived critical need locally, regionally, or nationally. Clearly, there is no shortage of causes competing for attention and top priority for donors to support. As a result, the Rockville science center must differentiate itself from others, responding to a need that donors think is so important that they place it above others, or at least include it within their giving portfolio. Thus the "case" made for the Rockville science center must be as strong and compelling as possible, yet realistic. The Rockville science center mission must closely align with this stated cause, which may be stated succinctly but compellingly in a "case statement" prepared for prospective donors.

Organizational credibility. Donors must have faith in the capability of the Rockville science center to execute its mission in an effective manner and to operate with a balanced budget. Thus, the Rockville science center must have a capable director, who manages staff and activities and who reports to the board. A predecessor organization, the not-for-profit Rockville Consortium for Science (RCS), has been in existence since 1989, and has a successful track record of organizing and presenting the annual Rockville Science Day, a major community undertaking, involving some 30 exhibitors each year. The all-volunteer organization does not have a track record operating a facility or running programs year-round. In this regard, the proposed partnership with MSC will significantly enhance the credibility of the Rockville science center by providing a linkage with an established and respected institution.

Board. The importance of a citizen board for the non-profit Rockville science center cannot be underestimated. Recruited from its community of supporters and those it serves, board members must be strategically selected to provide the organization with strong volunteer leadership. They must reflect the diversity of the community in order to gain broad support. In addition to providing expertise, board members must be capable to the greatest possible extent of contributing and raising funds. Depending on the governance structure negotiated with the MSC, the Rockville science center may garner the benefits of an existing, strong Board and its Development Committee.

The RCS has done an outstanding job in building initial support for a science center. In addition to presenting Science Day each year, it has taken the project to a key stage, namely City funding of this study. That is a major achievement. Should the project proceed, it will require a leadership group, as just described, that includes at least one RCS member to maintain continuity of effort. In addition, however, this Board must include advocates of political, social and economic stature from Rockville and Montgomery County. Its formation, role, and composition should be determined in concert with MSC.

Relationships with donor prospects. Because people give to people, success is ultimately dependent on the relationship between the donor and the solicitor of the gift. Donors rarely make significant contributions unless they are asked by the right person for the right amount. Success in fundraising depends on relationship-building with those capable of making contributions to the Rockville science center. The same principle applies to seeking funds from the public sector, where relationships must be developed over time with elected representatives and public officials, educating them about the value and importance of the cause well before support is sought.

Donor research. Identifying potential foundations, corporations, and government agencies that may be considered for potential support the Rockville science center is important, and this report takes initial steps in doing so. Finding individuals who believe strongly in a particular cause and have the necessary capacity to make a significant gift

is much more difficult. Although impersonal means such as direct mail can be used for smaller gifts, the most effective is connections that are made through the personal networks of supporters. That is why the role of the Board is so important to fundraising. A partnership with MSC could provide access to the expertise of the professional development staff in donor research, along with use of the existing donor database.

Follow-through. Excellent follow-through is an area where development efforts sometimes fall down. The "care and feeding" of donors and potential donors by the Rockville science center will require great attention to detail, especially if the effort is personalized. Appropriate acknowledgment and recognition must be provided on multiple occasions for any gift. The Rockville science center must put into place a database program along with the staff or volunteer support needed to track donor information and keep it up to date.

Perseverance. By its very nature, the relationship-building process, and therefore the fundraising process, takes time. The Rockville science center is at an embryonic stage in the fundraising process. The factors identified here must be put into place over time by board and staff who are dedicated to the Rockville science center and willing to work hard to transform it from vision to reality through the process described. In addition, donors may be involved in other causes at the moment or have multi-year pledges that must be completed before they can contribute substantially to another organization. Occasionally, an organization gets "lucky" and receives an unexpected contribution. But even such gifts almost always build on hard work developing the organization and its support.

In negotiating a partnership, MSC will be concerned with the potential for shifting existing donors and contributions to the Rockville science center, rather than adding new donors and increasing total dollars raised. The Rockville science center must be able to demonstrate how the resources and relationships that it brings to the table will make possible considerably greater total private and public support for the combined enterprise.

Construction Funding

Based on the potential for phased implementation, it is possible that initial needs for capital funds may be limited. That is fortunate, since raising significant funds require the planning and execution of a capital campaign, which can be very challenging for a new organization such as the Rockville science center, even with a partnership with MSC.

Unless the funding sources and their commitments are predetermined or already known, a formal campaign feasibility study should first be carried out to assess or validate the maximum level of funding likely to be raised from all sources. Such a study generally involves confidential interviews with past and present supporters, as well as those without pre-existing relationships who may be deemed "suspects" rather than "prospects." Such a study is carried out by fundraising counsel, firms or individuals who specialize in development. It is important to note that most fundraising counsel will not raise funds, but provide guidance to board and staff based on their knowledge and experience. It will remain the responsibility of the Rockville science center governing authority to play the major role in raising the capital funds.

In addition, a campaign chair must be recruited. The chair is typically a prominent member of the community who agrees to provide leadership, make the most critical asks, and help open the door for others. A lead gift of appropriate size will be critical to the success of the campaign. It must authenticate the effort and set the standard for all other gifts. The lead gift may be as much as 25% or more of the total amount needed. The lead gift or gifts are typically raised in what is known as the "quiet phase" of the campaign prior to public announcement of the goal.

Sources for Capital
Public funding is a primary source of capital for construction. Public bodies are typically much more willing to provide capital funds on a one-time basis, rather then commit to ongoing support. Nevertheless, the source of funding is challenging to secure, whether sought from federal, state, county, or local jurisdictions, particularly in the current period of tight budgets. As with private contributions, success may depend on strong relationships with members of the legislative and executive bodies, or relationships with those who do have strong connections, such as major individual or corporate political contributors. Oftentimes, use of a lobbyist can be helpful in making contacts and exploring options. These funds can be provided as a line item within a larger appropriation or as a separate measure, which may first require separate authorization.

Few national foundations provide support for "bricks and mortar." One notable exception is the Kresge Foundation in Troy, Michigan (www.kresge.org). Its highly competitive grant program provides challenge grants to stimulate the raising of matching funds that typically complete capital campaigns for facility construction. Although the funding focus is on building a facility, the Foundation makes its decisions based on the applying organization and its programs. In the words of President John E. Marshall III:

> We look very carefully at the programs to be housed in the buildings, at the organizations that propose them, at their financial audits, accreditation reports, and projections of the cost to operate new or expanded facilities. Questions about long-range, strategic plans, staff and program development, and governance are unavoidable. It is an opportunity to look into an organization's soul and to ask, "Who needs it? Who supports it? Who will work and give to advance it?" It has been said that a capital campaign will reveal whether an organization's board of trustees is composed of movers and shakers or of the moved and the shaken.

It is premature to consider this source of funding for the Rockville science center at this time.

The recent construction and opening of the Music Center at Strathmore provides an unusual case study. The project is atypical in the very high proportion of public funds in the $106 million capital campaign: Montgomery County (51%), State of Maryland (42%), and only 7% private donors. Board members, such as Chuck Lyons, CEO of The Gazette (Washington Post Co.), played key roles in obtaining the public appropriations. They were originally approved at lower levels during a period of state and county budget surpluses and would be less likely today. On the other hand, Strathmore does establish a significant precedent for funding major cultural facilities in the suburbs outside the heart of the District.

Operational Funding

For a small free-standing science center, earned income provides approximately half of the annual operating revenue. On average, the remainder is derived almost equally from public and private support.

Public Funds. Potential sources for ongoing public funds for the Rockville science center could be the City of Rockville, Montgomery County, or the State of Maryland. (Annual operating support from federal sources is extremely unlikely and will not be considered here.) Competition for limited public funding is extremely high and public funding is difficult to secure. As noted, time is needed to build relationships with elected officials and educate them about the value of this expenditure relative to the many other important needs. Grassroots support will be critical to justify public support for the Rockville science center. *Projections for typical levels of public funding are incorporated into the pro-forma operating budget, but it is important to note that no commitments of any kind have yet been made.*

City. The City of Rockville allocated $176,875 in the 2005 budget and the adopted 2006 budget includes $182,526 for the Croydon Creek Nature Center. The *pro-forma* assumes a comparable amount for the Rockville science center.

County. Montgomery County's Department of Park and Planning is budgeting $1,588,000 in 2006 for four nature centers, which served a total of 288,000 users in FY 2004. A comparable contribution by the County is assumed in the revenue projections.

State. The State of Maryland, through the Department of Education, appropriated the following operating allocations for the Maryland Science Center:

2003	$401,665
2004	$297,148
2005	$297,148
2006	$547,000

Other organizations received the following amounts in 2005 and 2006, respectively:

	2005	2006
Baltimore Museum of Industry	$81,000	$81,000
Maryland Historical Society	$68,000	$68,000
National Aquarium in Baltimore	$98,000	$98,000
Port Discovery	$91,000	$90,000

Assuming that relationships at the State level will take time to develop, the initial revenue projections do not include operating support from this source.

Federal. Nearly all federal funding (other than Congressional "earmarks") is made through competitive grant programs oriented toward specific time-limited projects. There are a limited number of agencies that provide such funding for museums. The closest to operating support is provided by the Institute for Museum and Library Services (IMLS) through its Museums for America program (www.imls.gov/grants/museum/mus_mfa.htm), which can award matching funds from $5,000 to $150,000. Like all other federal grants, these awards, are highly competitive and cannot serve as a regular source of support. Other relevant federal programs include the Informal Science Education program within the National Science Foundation (www.nsf.gov) and the Science Education Partnership Award program of the National Institutes of Health (www.ncrrsepa.org), which offer competitive grants based on peer-review of projects that address the requirements of their solicitations.

Private Contributions. The Rockville science center will raise through an "annual fund" the contributions necessary each year to balance its budget. The sources of this fund are contributions or grants for operating support from foundations, corporations, and individuals. This yearly campaign must be planned strategically, identifying realistic projections for gifts from potential donors. Because these projections are based on past gifts, the Rockville science center must start very conservatively.

Raising private funds for an organization must start with its "family." Other donors will expect those closest to the Rockville science center to make personal financial commitments based on their ability to give. In this case, the family would include:

- Members of the Rockville science center Board or Advisory Committee (depending on governance structure)
- MSC Board members, esp. those with personal or business ties to Montgomery County
- Members of the Rockville Science Consortium, present and past
- Financial supporters of and participants in Rockville Science Day
- Others who have been involved as volunteers or supporters

Special events also can raise funds for operating support, but are typically very time-consuming to organize and require considerable volunteer support. Because they can be expensive to execute well, they should be thought of primarily as "friends-raising" until such a time as the event is established enough to defray event expenses through donations or in-kind contributions. At that point, revenue from ticket sales can flow

directly to the bottom line. In the negotiations with MSC, the Rockville science center should discuss formation of a volunteer group for this purpose.

Foundations

Foundations provide 11% of charitable giving ($26 billion) overall. In the state of Maryland, there are approx. 1,400 foundations with $9 billion in assets. In 2002, they distributed $646 million in grants, an increase over 3.6% over the prior year, compared to a slight decrease nationally. Most foundation gifts are relatively modest; grants of $1 million or more were made by only 35 Maryland foundations. They are made based on the interests of the donor and trustees. The largest categories of giving were social services (28%), educational institutions (17%), health (14%), public/societal benefit (12%), religion (12%), environment (10%), and arts, culture, and humanities (6%). Most grants for museums would fall into the last category.

The value of Foundation grants goes beyond the funds they provide to a grantee. They often represent a "stamp of approval" because of the review process by staff and board that an organization must typically go through before a grant gets made. In this way, they provide legitimacy to the cause and encourage other donors to step forward and commit their funds as well.

Although larger foundations may make grants nationally and internationally, smaller foundation grants are made locally or regionally. In 2002, 39% of Maryland foundation grants went to organizations based within the state. Maryland is experiencing a dramatic growth in the number of foundations. Nearly half are less than ten years old; 570 (41%) have been created since 1996. Not surprisingly, these newer foundations are relatively small. They collectively hold assets of $600 million and made grants of $58 million (2002). The largest growth in foundations occurred in Montgomery County (229), resulting in a total of 432 foundations in the county, about one-third of the total number in the state. The following tables list the top foundations in Maryland by giving (those listed are in the top 25 in giving having assets in the top 50) and by giving in science and education.

Table 9. Top 25 Foundations in Maryland, by Total Giving.

Giving	*Assets*	*Foundation*	*Assets, millions*	*$ in MD*
1	1	Annie E. Casey Fdn	$2,709	32%
2	2	Harry and Jeanette Weinberg Fdn	1,936	27%
3	6	Eugene B. Casey Fdn	171	25%
5	12	Baltimore Community Fdn	95	94%
6	3	Sherman Fairchild Fdn	435	0.2%
7	5	Abell Fdn	178	96%
8	4	France-Merrick Fdn	210	97%
11	11	Jacob and Hilda Blaustein Fdn	81	63%
12	10	Morris Goldseker Fdn	81	100%
13	38	Alvin & Fanny Blaustein Thalheimer Fdn	34	100%
15	13	James M. Johnston Trust	73	10%
16	9	Clark-Winchcole Fdn	97	20%
19	49	T. Rowe Price Associates Fdn	20	81%
20	15	Edward E. Ford Fdn	58	5%
22	18	Rollins-Luetkemeyer Fdn	62	73%
23	14	John W. Kluge Fdn	71	4.1%
24	16	Joseph Meyerhoff Fund	58	73%
25	34	GEICO Philanthropic Fund	26	5.1%

Table 10. Ranking of Maryland Foundations sorted by giving to science, education and science and technology museums.

Foundation	*Headquarters*	*Total Giving*
The Annie E. Casey Foundation	Baltimore	$172,796,971
Howard Hughes Medical Institute	Chevy Chase	$57,627,987
United Jewish Endowment Fund of the Jewish Federation of Greater Washington	Rockville	$25,204,629
The Baltimore Community Foundation	Baltimore	$17,071,448
The Sherman Fairchild Foundation	Chevy Chase	$13,429,593
France-Merrick Foundation	Baltimore	$9,212,449
International Youth Foundation	Baltimore	$8,792,108
Eugene B. Casey Foundation	Gaithersburg	$8,658,840
The Abell Foundation	Baltimore	$8,278,670
Lockheed Martin Corporation Foundation	Bethesda	$7,052,143
The John. W. Kluge Foundation	Rockville	$5,741,135
The Jacob and Hilda Blaustein Foundation	Baltimore	$5,266,278
The Shelby Cullom Davis Foundation	Bethesda	$4,409,462
Clarke-Winchole Foundation	Bethesda	$4,326,275
The James M. Johnston Trust	Chevy Chase	$3,900,000
GEICO Philanthropic Foundation	Chevy Chase	$3,852,907
The Aaron Straus & Lillie Straus Foundation	Baltimore	$3,768,310
T. Rowe Price Associates Foundation	Baltimore	$3,377,354
Morris Goldseker Foundation	Baltimore	$3,305,998
National 4-H Council	Chevy Chase	$2,915,906

Source: The Foundation Center

The Montgomery County Community Foundation (MCCF) is a regional affiliate of the Community Foundation for the National Capital Region. It is small, holding $10 million in assets among 50 funds; last year it gave $1.5 million in grants. As with other community foundations, these grants are made from donor-advised charitable funds established by individuals, families, and organizations located in Montgomery County. They range considerably in size, from $10,000 to several million dollars. MCCF is less than ten years old and growing very rapidly. The number of funds has grown a remarkable 30% from the previous year. Although MCCF is more likely to support causes within Montgomery County, its grants tend to support programs for at-risk youth.

Corporations

Nationally, corporations provide less than 6% ($13 billion) of all giving. They make contributions either through a separate corporate foundation or a corporate giving program managed by the community affairs or public relations department. Unlike most foundation grants, corporations often seek either tangible or intangible benefits from their contributions. These benefits are much more explicit in the case of sponsorships, which funded through marketing funds. The Rockville science center is not in a strong position to seek sponsorships and should not devote any initial effort to this area.

Giving is generally made in the communities where corporate facilities are located. Thus the Rockville science center should focus on companies located in Montgomery County, especially those with corporate headquarters here, where the number and value of contributions are greatest. The most promising donors are those that have the greatest presence, as well as corporate alignment with the mission of the Rockville science center or personal interest by key executives.

As a starting point, the following list identifies the largest private science- and technology-related employers by numbers of employees in Rockville (source: Rockville Economic Development, Inc.). The asterisk indicates corporate headquarters.

Table 11. Largest private science- and technology-related employers in Rockville by numbers of employees.

Company	# Empl.	Web Site
Westat, Inc*	1400	www.westat.com
Aspen Systems Corp. (Lockheed Martin)	800	www.aspensys.com
Mid Atlantic Medical Services, Inc. (UnitedHealth)	613	www.mamsi.com
U.S. Pharmacopeia*	500	www.usp.org
BioReliance Corp. (Invitrogen)	425	www.bioreliance.com
BAE Applied Technologies	400	www.baesystems.com
Thomson Financial	375	www.thomson.com
Otsuka America Pharmaceutical, Inc.	360	www.otsuka.com
The Institute for Genomic Research (TIGR)*	350	www.tigr.org

Corporate (and individual) philanthropy, while an important part of the funding mix for most nonprofits, is not nearly so transparent as giving by foundations. Information is less widely available. Thus, most corporations do not publicly indicate their funding priorities other than in the broadest of terms, nor do they typically accept unsolicited requests.

Looking more broadly, Montgomery County is home to several very large employers. The following table shows the top 25; it is immediately obvious that the Federal Government is by far the largest, with over 30,000 employees total in the county.

Table 12. 25 largest employers in Montgomery County.

Company	Number employed	Industry
National Institutes of Health	18,627	Federal Government
Giant Food	7,500	Retail
Adventist Healthcare	7,000	Health care
Avaya	6,100	Professional services
Marriott International	4,900	Hospitality
Food & Drug Administration	4,600	Federal Government
Lockheed Martin	3,700	Manufacturing
IBM	3,100	Professional services
Nat. Inst. Standards & Technology	3,000	Federal Government
Holy Cross Hospital of Silver Spring	2,924	Health care
Montgomery College	2,782	Educational Services
National Oceanic and Atmospheric Administration	2,490	Federal Government
Kaiser Permanente	2,100	Health care
Hughes Network Systems	1,971	Manufacturing
Naval Surface Warfare Center, Carerock Division	1,700	Federal Government
Telenor Satellite Services	1,600	Information
American Society of Health Systems Pharmacists	1,500	Professional services
GEICO	1,500	Insurance
Suburban Hospital	1,400	Health care
Westat	1,400	Professional services
Montgomery General Hospital	1,350	Health care
National Association of Securities Dealers	1,330	Finance and insurance
Verizon	1,263	Information
Henry M. Jackson Foundation for the Advancement of Military Medicine	1,200	Health care
Discovery Communications	1,141	Information

Sources: Statewide economic development agencies and the Maryland Department of Business and Economic Development, October 2004

Another screen consists of those businesses that are focused on various aspects of bioscience and technology. A listing of such firms in Montgomery County can be found at www.montgomerycountymd.gov/content/ded/downloads/Biotech%20Companies.pdf. Although this data was compiled in 2003 and is incomplete, it provides another resource for identifying potential science center supporters and funders. In addition to those companies directly involved in biotech, the Rockville science center should explore, as a secondary strategy, potential prospects among those companies that sell scientific equipment, supplies, and support services to the firms on the technology corridor.

From a fundraising perspective, the focus on biotech and related fields will be attractive to corporations along the Technology Corridor. However, the Rockville science center will face several major challenges in raising funds from them. Many biotech companies are young and not yet at a stage of business development that generates significant excess of revenues over expenses. In addition, making contributions may not be part of the corporate culture and there may not be a tradition of corporate giving. Also, as noted, others do not have their headquarters in Maryland. Nevertheless, the Rockville science center should certainly develop relationships with these firms and may identify a CEO or corporate board member whose personal interest will lead to contributions. In addition, the involvement of these firms with the Rockville science center as sources of volunteers and in-kind support will strengthen the ties and likelihood of financial support.

As a means to simulate support, the Rockville science center should consider formation of a Corporate Board or advisory group with CEOs or officers of these corporations. Doing so will require finding one CEO who is respected among the other firms to assume a leadership role recruit other members. Membership on this board could be tied to corporate memberships, which can be tied to the size of the company.

Individuals

In many ways, contributions from individuals may be the most promising category, but also the most challenging to identify, nurture, and solicit. The largest percentage of giving in the U.S. by far, 75% ($179 billion), comes from individuals, plus another 9% ($22 billion) from bequests. Religious organizations are the largest category for giving (36%) overall, and especially so for individuals.

Identifying private donors is more difficult than finding likely public sources, foundations, or corporations. As described in *The Millionaire Next Door: The Surprising Secrets of America's Wealthy*, by Thomas J. Stanley and William D. Danko (Pocket Books, 1996), many affluent individuals remain "invisible" unless they are known donors to other organizations. In addition, they may not be aware of the Rockville science center or have a personal interest in supporting it.

For these reasons, the best individual prospects are the members of the Rockville science center "family" and then the MSC "family," as noted previously. The next most-promising level of individual donors would be those proposed by these initial supporters based on their personal or business relationships, knowledge of giving capacity, involvement in community causes, and potential interest in the Rockville science center mission. Beyond this internally-generated list, research can be carried out from public sources to identify a further removed set of prospects among those who contribute to other related causes in Montgomery County, such as scholarships to Montgomery County College. That donor list can be found at www.montgomerycollege.edu/finaid/foundationlist033005.pdf.

Certain individuals are well-known in the area for their scientific and business acumen along the Technology Corridor. One of the best known is J. Craig Venter, who founded The Institute for Genomic Research (TIGR), which decoded the genome of the first free-living organism, and then served as the first President of Celera Genomics, which sequenced the human genome. He is currently President of the J. Craig Venter Institute,

a "not-for-profit research institute dedicated to the advancement of the science of genomics; the understanding of its implications for society; and communication of those results to the scientific community, the public, and policymakers." Venter is a potential prospect, but, of course, every other organization seeking funds targets him and a few others in this category. The Rockville science center's advantage is that its mission may be more closely tied to the Venter Institute mission and personal interests; on the other hand, funds may be focused internally.

Other sources of information are the names of political contributors for offices at all levels. For example, in 2004, Montgomery County donors contributed $27.7 million towards candidates for federal office, more than half the money raised in Maryland and far more than any other county. However, these political donors may or may not have any interest in making charitable contributions.

One of the major challenges involved in raising personal contributions to the Rockville science center is the significant competition for funds from the many existing not-for-profit organizations throughout the metropolitan area. As noted in an Associated Press article: "Strathmore officials said they had difficulty raising private money for the endowment to help cover operating costs, since many large donors focused charitable giving on arts institutions in Washington, not the suburbs."

Conclusions and Next Steps

A science center in Rockville is feasible based on the content, presentation, attendance, economic, and facility circumstances and assumptions made in this report.

The consultants recommend that, upon acceptance of this study by the Rockville City Council, an individual or small group be charged with opening an exploratory conversation with the President and CEO of the Maryland Science Center, Van Reiner. This conversation will investigate the possibility of a potential Rockville science center affiliating with the Maryland Science Center in a way that is mutually satisfactory and supportive, as well as respectful of the need for an appropriate level of autonomy for the Rockville operation.

Memorandum of Understanding

The first step of negotiations between Rockville and the Maryland Science Center should be agreement upon a Memorandum of Understanding (MOU) regarding the intent to work together on developing a Rockville science center. The MOU should include determination of the governance and operating structure, e.g., will the new center be an independent non-profit organization or will it be subsumed under the nonprofit incorporation of the Maryland Science Center? An important element in this regard is the extent of committed or expected government funding, from various levels. It also will include definition of the local governance and, thus, the composition, responsibilities and authority of a local governing/advisory board. If the Rockville center is to be a separate entity, its governing body will be empowered to proceed with application for 501.c.3 status.

Matters for Subsequent Consideration

Upon completion of the MOU, the following key issues will have to be addressed as appropriate and necessary:

- Project timetable
- Public announcement
- Name and identity
- Staffing plan
- Site selection and acquisition
- Composition of programs
- Initial financial planning
- Exhibition and facilities plan
- Phasing strategy

Shared/contracted services plan (including fundraising)
Potential partnerships and collaborations

Fundraising

As part of the negotiations with MSC, after the previously mentioned issues have been addressed, the Rockville science center should establish the basis for a strategic partnership for fundraising. All fundraising efforts must be carefully coordinated to avoid any semblance or perception by donors of "competition" for funds. Fundraising must build on the mutual strengths of the two entities. MSC will provide credibility and open doors, while the Rockville science center makes possible a much stronger rationale for obtaining contributions among donors in Montgomery County and those who support its mission. That rationale must be clearly articulated in a Case Statement that is complementary to that of MSC.

Then a fundraising plan for the Rockville science center should be developed by or with the MSC Development staff. This plan should indicate the process and ground rules for raising funds. It should include development training of the new the Rockville science center governing authority, followed by prospect research and screening. The Rockville science center supporters at all levels should be encouraged and empowered to identify and cultivate prospective donors so long as such efforts are coordinated. If capital funds will be required, the Rockville science center in concert with MSC should identify fundraising counsel to conduct a feasibility study and then organize the campaign.

In any event, the Rockville science center should conduct an ongoing advocacy "campaign" to build awareness and support throughout Montgomery County. This effort should involve not just civic leaders but also the grassroots. Every opportunity should be sought to present the Rockville science center case, including civic organizations (e.g., Rotary, Kiwanis, Homeowner Associations) and outreach to other community groups. Printed materials, such as a brochure, should be prepared that can be left after presentations. A request can be made for membership or for contributions.

As should be clear from this report, there is no single "magic bullet" in fundraising. The effort requires patience and perseverance, but if executed well, should provide a strong base of support for launching and operating the Rockville science center.

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Appendix A

Feasibility Study Charrette Notes
October 30, 2004

(www.rockvillemd.gov/cip/sciencecenter)

Welcome and Intros

Councilmember Susan Hoffmann welcomed Charrette participants and said that the charrette is the key element of Phase I of Rockville's feasibility study to create a science center. Councilmember Hoffmann outlined the elements of Phases II and III of the study, mentioned some of the many benefits to the community, and emphasized that, for the science center to become a reality, the City will need to partner with many of the organizations represented at the charrette. She stressed that a the science center will serve not only Rockville residents, schools and businesses, but the larger Montgomery County and regional community as well.

Director of Recreation and Parks Burt Hall introduced the project consultants, Mac West of Informal Learning Experiences and Dave Ucko of Museums + more.

Mac West began the morning session. Participants introduced themselves giving name and organization represented.

Handouts

- Meeting Agenda
- Informal Science Learning Opportunities in the Region
- Participant Sketches

Introduction to the Field of Science Centers (PowerPoint presentation)

Mac and Dave presented a talk and slide show to introduce participants to the field of science centers. They discussed the need for a common vocabulary, an understanding of initial critical matters, the need to identify a successful niche, and to plan the science center within the framework of existing local/regional resources. Science centers range from the formal to the informal, with a wide variety of content delivery. Examples were presented of science center activities at centers around the U.S.

There is a range of mechanisms for management and governance of science centers – public v. private, profit v. non-profit, etc. Funding for science centers generally comes from earned income, public funds and private funds. Maintaining attendance is an ongoing challenge for science centers, often negatively affecting revenues. The retail industry provides many types of hands-on learning/discovery experiences, presenting another challenge. Other challenges include busy, two-earner (and two-job) families, changing demographics (both age and ethnicity), public expectations, accountability, wide availability of technology (Internet), and competition with other leisure time opportunities.

Opportunities for science centers and trends were discussed by Mac and Dave. Centers must strive for wide community engagement, to "become embedded" in the community. Many serve as community centers. New audiences include senior citizens and young children. The Internet presents opportunities as well as challenges. Collaboration with a wide range of community organizations is key. Working with schools, libraries, colleges, Rockville could become a "campus for learning."

The science center should be innovative, unique to Rockville and move the field in new directions. Attention to sustainability is paramount in planning services, programs, activities, target audiences, niche, etc. Science centers must remain current to keep the doors open.

Open Group Discussion

Target Audiences

- Young children-primary/secondary; pre-school

- Families
- Parents
- Teachers (training)
- Outreach to scientists (training)
- Adults
- Supporters/stakeholders
- Outreach (via technology) – international
- School system
- Immigrants (families) specifically Asian, Hispanic
- Tourists
- "Other 95%" (5% of population is highly interested in science)
- Local or regional?
- Retired scientist/grandparents
- Can't be all things to all people
- Link the center to MCPS classroom curricula, perhaps selected grades
- Few opportunities for high school-aged science students
- Use the environment and nature as "the hook"
- Target audiences include local businesses and federal agencies, which can be major supporters.
- Hours of operation a critical component
- Focus on indigenous science
- Expand boundaries via TV and the Internet
- Middle school is when students become most interested in science

Purpose

- Informal learning for families/students – excite
- Showcase/interpret biotech; biomedical; I.T. of Montgomery County
- Access to resources in the area
- Role of science
- Technology innovation in science education testing
- Biotechnology as integrating theme
- Stimulate workforce for tech at all levels
- Connection to peoples' lives
- Science as team activity
- Inspire visitor interest in science
- Instead of looking at other resources as "competition," use them as resources. Become a "museum without walls" – provide connections to other resources
- Place for sharing by different professions – networking
- Value of science (by "95%") to society – advocates, relevance
- Educated citizenry
- Content, careers (middle and high school)
- Focus on science learning needs that are underserved – physical sciences
- Help parents understand value
- Problem solving skills for children
- Coordinate with school curriculum – resource for teachers
- Montgomery County target area, I-270 corridor
- Facilitator role, clearing house
- Provide community access to scientists
- Science viewed as both good and bad – mixed up with political and social issues
- Linkage to student achievement standards – local, international
- Provide hands-on experiences
- Increase number of scientists
- Opportunities to work with local cable TV providers – weekly show showcasing local scientists.
- Use science that is here in Rockville
- Clearing house for community-based science resources
- Provide science in multiple languages – Maryland Science Ct. targets non-English speaking immigrants with success

- Determining target audience is essential
- Emphasize international contributions to science.
- Look at successful centers – imitate

Pitfalls/Issues

- Connection to schools critical
- Competing for funding
- Many parents do not see science as an important subject
- System vs. teachers
- Timeframe phasing – need to think ahead of budgeting
- Lack of recognition of importance of science
- Translation into reality/KISS (Keep It Simple, Stupid)
- Start small, build interest
- Montgomery College Science building connection
- Look at becoming a world-class model for technology-based learning. This could bring in big $ from the I.T. business world.
- This should be a Montgomery County-wide facility located in Rockville.
- Should be located near Metro.
- Rather than loving science, the goal should be to "value" science.
- Show how support and funding for science research benefits all.
- Promote why science is important, what are the career opportunities, science-based political issues (stem cell research, cloning, weapons, etc.)
- To meet MCPS needs, emphasis should be on astronomy, chemistry and physics as opposed to biosciences.
- Must respond to dismal performance of American students in science – TIMS study (Teaching Integrated Mathematics and Science)
- Provide glimpse of what career opportunities are available via physics, chemistry, earth science, etc.
- Be a specific resource for MCPS teachers
- Be a clearinghouse to link science-based business resources to schools.
- Outcomes should include: more kids going into science careers, more awareness of the environment and other science disciplines, more science center supporters.

Breakout I

Strategies, approaches, and programs/exhibits for the Science Center. What will it provide to whom?

Red group

- Outreach to communities
- Church
- Want a better life (common point)
- Parents
- "What is…" programs
- Social groups
- Success oriented
- Relevancy
- Focus on uniqueness
- How science applies to daily life
- How science improves career conservation
- Reinforcement – relevance
- Engaging
- Go to where they are
- Language: theirs no "science"
- "Physics of …"
- Bio/Medical
- Physical Sciences
- 18 federal agencies and labs

Green group

- Link to schools may drive larger audience
- Physical structure with targeted topics with an outreach components (interactive I.T. media connections, traveling programs, links to existing labs and businesses) of flexible topics
- Provide mentors
- Teacher staff development - based on teachers needs; drives curriculum connections; student participation; funds coming from student visits; teacher factor is a multiplier factor for much more participation
- Conference capabilities
- Enrichment summer camps – after school
- Coordinating community resources biotech – bottleneck; schools need greater capacity

Silver group

- Mentors for kids doing science projects
- After school hands-on science
- Web or real site to explore local science issues
- Broker adult and children's programs run by others
- A group of Bill Nyes – "Nerds On Call" to do outreach programs
- CSI-type team of science leaders to do dynamic presentations in the community

Gold group

- Emphasize connection to career application
- Family Involvement
- Active coordination with school curriculum
- Use as platform to teach communication skills
- Resource availability – Information clearing house
- Leverage public school and other resources
- Assess availability of public space

What?

- Clearinghouse
- Coordination of local professional volunteers
- Target under traditionally involved communities
- Demonstrate accessibility
- Mentoring

Whom?

- Educators
- Families
- Providers
- Community
- Distribution – Comcast, local media

Blue group

Strategies

- Multi-layered to target all audiences together
- Location, Location
- Use new technologies to communicate information (TV/Internet)
- Clearinghouse of information (partnerships-science content programs funding/resources)
- Mobile science

Exhibit & Program Emphasis

- Multi-layered – don't talk down to kids
- Multi-discipline
- Math, Physics, Chemistry (Core Sciences)
- Problem solving
- Career options

- Scientific literacy (getting public involved)
- Event based/life based
- Clearing house for science/scientists/science education
- Family programs
- Interactive activities
- Traveling exhibits (large and small)
- Focus on technology within community
- Professional development for teachers
- Benefits of science (example space program very successful)
- Community outreach
- Experience science with math = Do Science

Breakout II

Niche and distinguishing features
Where will it fit into the Rockville/Montgomery County environment, as well as in the bigger picture and what will be the benefits?

Gold group

- Provide access to resources in Montgomery County → other resources for teachers access to remote technology
- Needs to go beyond Rockville
- Community destination
- Share this discussion with local businesses so they can showcase what they do
- Use distance learning to reach some groups
- Need model to reach underserved populations
- Interactive, teaching facility not just an exhibit space
- Program development and export

Benefits

- Environment quality
- More access to science for kids
- Science is demystified
- Multicultural views of science
- "Branding" Montgomery County as a place that does science
- Improved science teaching

Green group

Niche

- Identify what is in community
- Explain what we have for all ages/interests
- We can't be everything=focus 1) basics 2) available resources
- Fill gaps/needs
- Fill unmet needs of school
- Don't limit to school needs
- Can't compete – focus on unique capabilities/facilities
- School field trip restrictions post 9/11

Clearinghouse

- Ties existing facilities together
- Important to identify and simplify existing info. To the audience/user
- Science and technology associations
- Science "e-bay" – one stop shopping for businesses, teachers and students

Funding??

- Business contributions
- Not user fees

Brick & Mortar

- Home school students – daytime lab
- After school

- Weekend programs
- Engineering clubs
- Address un-reached population
- Focus on more than Rockville

Benefits to business supporters

- Tax write off
- More educated workforce
- Local awareness of industry, associations, societies and clubs

Red group

- Broker – centralized location for science resources info.
- Info regarding scientific enterprise in County
- Why should Rockville taxpayers support this? Becomes a model – helps draw economic resources to County
- Outreach van statewide
- Organize existing programs into larger coordinated effort
- Comcast weekly TV show on science
- Enhance the neighborhood where located
- Place to display biotech "stuff" – historical development

Silver group

- Niche in Metro area
  - Serve to facilitate each "niche"
  - Stronger interactions within regional businesses
  - Partnership for group interests
- Niche in Montgomery County
  - Serve as a hub for state and local ("yellow pages") – gives visibility
- Niche in Rockville
  - Proximity is key – all will use
  - Think BIGGER (state)
  - Outreach is key
- Formal education system; Community careers; Library/museum = Science Center in the middle of these
- Experiments/access
- Hands-on Dino Hunts
- Natural community – plants and animals
- Community – based activities – distribution of information through schools
- Become conduit for other organizations' activities
- Organize community access to area research organizations
- Host company exhibits at science center – permanent exhibits and science in the neighborhood
- Data collection activities – water quality monitoring; air quality/school attendance, etc.
- Support "inquiry request" activities and store results as a community resource
- Use longer term projects and community data resource – development to drive constituency
- Outreach mechanisms
  - Partnering-libraries
  - Mentoring
  - What does a _____do? – share the excitement and demonstrate the work

Breakout III

Community resources currently or potentially available to the science center. What strategic partnerships are desirable/likely? Should an interim facility be considered? If so, where?

Gold Group

- Partnership = time + talent
- Advantage to center/community
- Place to reinforce and enrich, school concepts
- Provide tax base (hotel, food, etc.)
- Now local groups do not have to travel as far
- Close to Rockville library
- Site to inform the larger public of local industries (others might think to invest/locate in the area
- Catalyst for revitalization
- Idea of location and groups needs to be taken into account
- Who does it influence? How?

Silver Group

- Smithsonian
- Federal Labs
- TV/cable stations
- Private Corporations – Celera Genomics, HGS, Gene Logic, Medimmune
- National science Foundation
- NASA
- Johns Hopkins
- Washington Academy of Sciences
- Packard Foundation
- Foundations – foundation center, foundation directory
- City of Rockville
- Montgomery County
- MCPS School Board
- Private developers (help with RFP)
- State of Maryland
- City of Gaithersburg
- Private donations
- Montgomery County Gem, Lapidary and Mineral Society
- Montgomery Chamber of Commerce
- Geological Survey

Interim Facility – Stonestreet warehouse (school board)

Green Group

- Media – Gazette, Washington Post, Comcast, local TV, Montgomery College TV, The Rockville Channel, MCPS TV, PBS and radio
- Governments – NIH, NIST, CIA, DOE, Smithsonian, NASA, EPA, NOAA, Montgomery County, City of Rockville, City of Gaithersburg, MCPS, MD Geologic Survey, Armed Forces
- Businesses – Discovery Channel, Hughes Group, IBM, Lockheed-Martin, MedImmune, Celera, H.G.S., Genvec, Comsat
- Educational Institutions – UMD, Johns Hopkins, Montgomery College, Georgetown, George Washington, AU, home based schools, MCPS, private schools
- Non-profits – TIGR, CARB MD BIO, Chesapeake Bay Trust, Audubon, Gem, Lapidary… retired federal workers, trade associations, local foundations, Isaac Walton League, MCAR

Interim Facility

- Science Center without walls – 1,000 sq. ft. of office
- College campus

- MCPS warehouse – Stonestreet
- Mobile classroom
- Local government building
- Vacant store or office
- Surplus school building

Silver group

- NSF
- City, County, State
- Local high tech. industry (Celera, Bioreliance, LM, Raytheon, Hughes, Bechtel)
- MCPS
- Colleges/Universities (UMD, Hopkins, MC, etc.)
- Professional societies (AAAS, ACS, AAP, APS, NCTM, ASTC, AAS, etc.)
- Federal (NIH, NASA, EPA, NOAA, NIMH, NRL, etc.)
- RCS
- Discovery Comm.
- Economic development agencies
- Local science centers, museums, planetarium
- Community civic associations (GS, BS, etc.)
- Amateurs
- Foundations (Gudelsky, etc.)
- Local media (Post, 88.5, Bob Ryan, etc.)
- Politicians

Interim Facility

- NO! – Limits resources, Limits scope, Limits vision
- City Hall
- Rockville Library

Blue Group

- Government – NIH, FDA, NSF, NIST, DOE, Montgomery County, State
- Industry – TIGR, JCV, HGS, MedImunne, Celera, Otsuka, Qiagen, Biocon, Aspen, Lockheed-Martin, HP, IBM, GE
- Organizations – FASEB, Business Roundtable, HHMI, universities and colleges, MD Bio, MD Hi Tech Council
- Retail – Galyans, Sports Authority, etc.
- People – retired scientists, Burt Hall, CEOs, politicians

Interim Facility

- Virtual first (National Health Museum) – funding?
- Trailers
- Staff before location – donated space
- Danger of starting too small – get stuck and are unable to launch some programs
- Lose big picture

Red Group

- Assuming the science center is a 501c3
- Howard Hughes
- State of Maryland
- City of Rockville
- County
- Tech Council of Maryland
- Trade associations of technology companies in Maryland
- MCPS
- Lockheed
- Comcast

- Federal Agencies – NIH, NIST
- Montgomery College, UMD, Hopkins, Universities at Shady Grove
- Incubators
- Chris Van Hollan
- MD Science Center
- Foundations
- Cheryl Kagen (Franklin Foundation)

Charrette Participants

Judy E. Ackerman
Vice President and Provost – Rockville Campus
Montgomery College

Elaine Amir
Director of Montgomery County Campus
Johns Hopkins University

Jim Caldwell
Director, Department of Environmental Protection
Montgomery County

A. Christine Canham
Science Resource Teacher
T.S. Wootton High School, Montgomery County Public Schools

Arthur D. Chambers, AICP
Director, Community Planning and Development Services
City of Rockville

Lewis E. Dronenburg
Civic Center Superintendent, Recreation and Parks Department
City of Rockville

George Durland
President
The Gem, Lapidary and Mineral Society of Montgomery County, Maryland

Bob Ekman
Vice President, Rockville Consortium for Science

Pedro E. Flores
GIS Manager
City of Rockville

Bruce A. Fuchs, Ph.D.
Director, NIH Office of Science Education
National Institutes of Health

Jackie Geer
6th and 7th grade Science teacher: Earth Science and Biology
Cabin John Middle School, Montgomery County Public Schools

Charles Haughey
Member
Montgomery County Board of Education

Clifford E. Lanham
Technology Management Consultant
Rockville Economic Development Inc. (REDI)

Saba Mahboob, Ph.D.
Lower Fat Food

Phyllis Marcuccio
Rockville Consortium for Science

M. Sheila Marshall
President
Rockville Consortium for Science, Inc.

Lou Mayo
Astronomer, Program Manager
Raytheon

David F. McGinnis, Jr.
Physical Scientist
U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA)

Michael Mogill
Howtheweatherworks
Rockville Consortium for Science

Valerie Oliver
Nature Center Supervisor
City of Rockville

Sanjay Rai
Instructional Dean
Montgomery College

Ted Reuther
City of Rockville Resident

Karen Rubin-Hamilton
President
Explore-it-all Science Center, Glen Echo

Kate Savage
Recreation & Parks Advisory Board
City of Rockville

Melvin D. Smith II
7th Grade Science Teacher (General and Center Programs)
Montgomery County Public Schools

Marcia P. Sward
Director of Environmental Education
Audubon Naturalist Society

Michael Szesze
Program Supervisor for Science, K-12
Montgomery County Public Schools

Bonnie Van Dorn
Executive Director
Association of Science-Technology Centers (an international not-for-profit organization of science centers and museums dedicated to furthering the public understanding of science among increasingly diverse audiences)

Chris Ward
Director of Industry Networks
Technology Council of Maryland

Dr. Harold Williams
Planetarium Coordinator and physics and geology lab coordinator
Montgomery College at Takoma Park

Patrick L. Woodward
Judge, Circuit Court for Montgomery County

Appendix B

Interviewees

Judy Ackerman, Provost, Montgomery College
Barbara Askjaer, Vice President, Communications, J. Craig Venter Science Foundation
Jose Luis Barata, Executive Director, Hands-On Science Outreach
Marie Bravo, Office of Information Services,
James Caldwell, Montgomery County Department of Environmental Protection
Lou D'Ovilia, Office of Councilman Michael Subin
Brian Fish, senior aide to Councilman Michael Subin
David Fry, Teacher, Montgomery County Public Schools
Charles Gale, Teacher, Montgomery County Public Schools
Kelly Grof, Executive Director, Montgomery County Convention and Visitors Bureau
Charles Haughey, Montgomery County Board of Education
Harriet Henderson, Director, Montgomery County Libraries
David Humpton, City Manager, Gaithersburg
Meaghan Karp, Teacher, Montgomery County Public Schools
Phyllis Katz, Founder, Hands-On Science Outreach
Jamie Kikeska, Teacher, Montgomery County Public Schools
Patrice Legros, Executive Director, Marian Koshland Science Museum
Lisa McDonald, Manager, Education Group, J. Craig Venter Institute
Debra Moser, Executive Director, Rockville Arts Place
National Institute of Standards and Technology
Valerie Oliver, Manager, Croydon Creek Nature Center
Vicki Rafel, Montgomery County Public Schools PTA
Sanjay Rai, Dean of Science, Engineering and Mathematics, Montgomery College
Van Reiner, Executive Director, Maryland Science Center
Roy Shafer, The Roy Shafer Company
Sally Sternbach, Executive Director, Rockville Economic Development, Inc.
Marcia Sward, Director of Environmental Education, Audubon Naturalist Center
Chris Ward, Director of Bioalliance, Technology Council of Maryland
Walter Witschey, Executive Director, Science Museum of Virginia
Robert Wright, Fossil Fuels, Department of Energy
Pete Yancone, Director of Education, Maryland Science Center

Appendix C

Comparable Institutions: Edge Cities

Data from Institutions: See accompanying matrices for specific information. Data is drawn from institutions' web sites, IRS form 990, and consultants' personal knowledge; data not available for empty fields.

Ann Arbor Hands-On Museum, Ann Arbor, MI (far west suburban Detroit)
Bay Area Discovery Museum, Sausalito, CA (north suburban San Francisco)
BNL Science Museum, Upton, NY (Long Island)
Children's Science Explorium, Boca Raton, FL (north suburban Miami)
Cranbrook Institute of Science (northwest suburban Detroit)
Discovery Center for Science & Technology,
Thousand Oaks, CA (north suburban Los Angeles)
Discovery Museums, Acton, MA (west suburban Boston)
Discovery Science Center, Santa Ana, CA (southeast suburban Los Angeles)
Dolan DNA Learning Center, Cold Spring Harbor, NY (Long Island)
Gulfcoast Wonder and Imagination Zone, Sarasota, FL (south suburban Tampa)
Sci-Tech, Aurora, IL (west suburban Chicago)

Significant aspects of each:

Ann Arbor Hands-On Museum, Ann Arbor, MI
•Private nonprofit
•Founded 1981
•Building 40,000 sq ft
•Public area 17,000 sq ft
•Former firehouse
•Attendance on-site 166,366; Group on-site 31,138; Outreach 26,817
•Staff 21/80/110
•Revenue $1,803,453; public $132,323
•Expense $1.635,964

BNL Science Museum, Upton, NY
•Federal, Department of Energy
•Founded 1977
•Public space 6,000 sq ft
•Attendance on-site 20,000
•Sponsors competitions, science fairs
•Staff 1/5

Children's Science Explorium, Boca Raton, FL
•Municipal government, Parks and Recreation
•Founded 1998
•Public space 1,900
•Attendance on-site 55,000
•Science playground, Starlab
•Staff 4/6/10
•Budget $312,340 Public 100%

Cranbrook Institute of Science, Bloomfield Hills, MI
•Cranbrook Educational Community; private nonprofit
•Founded 1932
•Building 65,500 sq ft
•Public space 19,300
•Attendance on-site 158,367; Group on-site 56,016; Outreach 17,189
•Nature center, planetarium, observatory
•Bat Zone
•Staff 24/43/70
•Revenue $2,898,296; public $6,564 (plus endowment)
•Expense $3,883,454

Discovery Center, Thousand Oaks, CA
•Founded @1996
•Museum Without Walls
•101 Technology Corridor
•70,000 sq ft; $25 million
•Revenue $138,830; Expense $219,962

Discovery Museums, Acton, MA
•Private nonprofit
•Founded 1981
•3 buildings, 12,545 sq ft
•Public space 8,500 sq ft
•Attendance on-site 140,000; School on-site 16,000; Outreach 13,000
•Staff 14/80/50
•Revenue $1,089,000
•Expense $1,079,000

Discovery Science Center, Santa Ana, CA
•Private nonprofit
•Founded 1998
•Building 59,000 sq ft
•Attendance on-site 250,000; group on-site 74,300; Outreach 21,000
•3-D laser theater; striking building
•Computer lab; adding dinosaurs
•Revenue $3,683,918; public $560,000
•Expense $3,836,209

Dolan DNA Science Center, Cold Spring Harbor, NY
•Founded 1988
•Federal, Department of Energy
•Building 27,000 sq ft
•Teaching/research laboratories
•Attendance on-site 33,351; Groups on-site 15,604
•Staff 20
•Budget ~$2,500,000

Water Resources Education Center, Vancouver, WA
•City of Vancouver
•Founded 1996
•Attendance on-site 50,000 (approx.)
•Live sturgeon in 350 gallon aquarium; water related interactive exhibits
•Computer game room; theater

Sci-Tech Museum, Aurora, IL
•Private nonprofit
•Founded 1988
•Building 40,000 sq ft
•Public space 26,000
•Attendance on-site, 50,658; Group on-site 23,404; Outreach 21,318
•Former post office ($1/year)
•Staff 12/35/25
•Revenue $1,023,317; Public $290,119
•Expense $1,017,658

Gulfcoast Wonder and Imagination Zone, Sarasota, FL
•Private nonprofit
•Founded 1990
•Building 70,000 sq ft
•Public space 25,000 sq ft
•Attendance on-site 130,000; Group on-site 48,000; Outreach 20,000
•Former library building
•Staff 14/22/50
•Revenue $3,108,000; public $650,000
•Expense $3,050,000

Basic Information

Museum	Location	MSA	MSA Pop	Governance	Mission Statement
Ann Arbor Hands-On Museum	Ann Arbor, MI	Detroit--Ann Arbor--Flint, MI	5,456,428	independent non-profit	To provide an opportunity for people of all ages to discover and enjoy the wonder of science, math, and technology in an interactive environment that promotes science literacy through experimentation, exploration, and education.
Bay Area Discovery Museum	Sausalito, CA	San Francisco--Oakland--San Jose, CA	7,039,362	independent non-profit	To engage, delight and educate children through the exploration of and connection with the local environment and the diverse communities that live here.
BNL Science Museum	Upton, NY	Nassau--Suffolk, NY	2,753,913	Federal	We are dedicated to increasing science awareness by utilizing the inquiry method of teaching.
Children's Science Explorium	Boca Raton, FL	West Palm Beach--Boca Raton, FL	1,131,184	City of Boca Raton	To educate through interactive hands-on exhibits which serve as the focal point in providing unique avenues for exploring the wonders of science and increasing the scientific and technological literacy of children.
Cranbrook Institute of Science	Bloomfield Hills, MI	Detroit--Ann Arbor--Flint, MI	5,456,428	independent non-profit	Cranbrook Institute of Science is a natural history and science museum that fosters in its audiences a passion for understanding the world around them and a lifelong love of learning. Through its broadly based educational programs, its permanent and changing exhibits and its collections and research, the Institute develops a scientifically literate public able to cope with today's knowledge-based society. Cranbrook Institute of Science generates the enthusiasm for learning about the natural world that will produce the scientists of tomorrow.
Discovery Center for Science & Technology	Thousand Oaks, CA	Los Angeles--Long Beach, CA	9,519,338	independent non-profit	To promote a greater understanding of science and technology while inspiring people of all ages to expand their thinking and creative powers.
Discovery Museums	Acton, MA	Boston--Worcester--Lawrence, MA--NH--ME--CT	5,819,100	independent non-profit	The Discovery Museums encourage children, families, and educators to explore the wonders of science, nature, humanities, and the arts by engaging visitors in positive innovative experiences.
Discovery Science Center	Santa Ana, CA	Los Angeles--Long Beach, CA	9,519,338	independent non-profit	The Mission of the Discovery Center is to promote a greater understanding of science and technology while inspiring people of all ages to expand their thinking and creative powers.

Museum	Location	MSA	MSA Pop	Governance	Mission Statement
Dolan DNA Learning Center	Cold Spring Harbor, NY	Nassau--Suffolk, NY	2,753,913	independent non-profit	To prepare students and families to thrive in the gene age
Gulfcoast Wonder & Imagination Zone	Sarasota, FL	Sarasota--Bradenton, FL MSA	589,959	independent non-profit	G.WIZ strives to make science relevant, technology understandable and learning an interactive adventure for people of all ages.
Health World Children's Museum	Barrington, IL	Chicago--Gary--Kenosha, IL--IN--WI	9,157,540	independent non-profit	Health World is a not-for-profit children's health education museum and learning center; a center that offers children the "hands-on" opportunity to learn more about the importance of leading a healthy lifestyle. Health World promotes interactive learning through state-of-the-art structured programming, exhibits, and discovery zones.
Lindsay Wildlife Museum	Walnut Creek, CA	San Francisco--Oakland--San Jose, CA	7,039,362	independent non-profit	Lindsay Wildlife Museum connects people with wildlife to inspire responsibility and respect for the world we share.
MIT Museum	Cambridge, MA	Boston--Worcester--Lawrence, MA--NH--ME--CT	5,819,100	Massachusetts Institute of Technology	To document, interpret, and communicate to a diverse audience, the activities and achievements of the Massachusetts Institute of Technology and the worldwide impact of its innovation, particularly in the fields of science and technology; and to enhance the spirit of community inside the Institute through the promotion of dialog both at MIT and between the Institute and the wider world.
National Inventors' Hall of Fame	Akron, OH	Cleveland--Akron, OH	2,945,831	independent non-profit	Educational organization that showcases and fosters inventions and creative talent.
SciTech Hands-On Museum	Aurora, IL	Chicago--Gary--Kenosha, IL--IN--WI	9,157,540	independent non-profit	To provide a cultural resource focusing on science and technology for a broad and general audience
Water Resources Education Center	Vancouver, WA	Portland--Salem, OR--WA	2,265,223	City of Vancouver	To teach people of all ages to better care for and make wise decisions about water.

Staff and Facilities

Museum	Facilities		Total sf	Exhibits sf	FT Staff	PT Staff	Vol Staff
	Description	Collections					
Ann Arbor Hands-On Museum			40000	17000	21	80	110
Bay Area Discovery Museum		Art; nature; science; culture of the Bay Area; photography; media center	51,240	21955	30	45	70
BNL Science Museum	Educational facilities; 6,000 sf exhibit space	Objects relating to scientific research	6,000	6000	1	5	???
Children's Science Explorium	15-seat auditorium; demo classroom; 1,700 sf exhibit space outdoor science playground	Interactive physical science exhibits	???	1700	4	6	10
Cranbrook Institute of Science	18,000-volume library focusing on the Institute's areas of specialization; observatory & planetarium; 235-seat auditorium; classrooms; Café; herbarium; nature center; participation physics hall; discovery room; ethnic & natural history; gift shop	Mineralogy; anthropology; zoology; botany; geology	65,500	19300	46/24	12/43	300/70
Discovery Center for Science & Technology	"Museum Without Walls" travels to various sites to present programs.		70000	???	???	???	???
Discovery Museums	3 acres of wooded land; woodland path abutted by 200 acres of conservation land; discovery classroom; banquet facilities	Children's Museum: hands-on interactive exhibit rooms including: Train Room, Discovery Ship, Bessie's Play Diner, and Sensations. Science Museum: interactive exhibits with scientific themes including Inventor's Workshop, Math Room, Light & Color Room, Water Room, Earth Science, Sound & Communication, Electricity, Magnets and Nature Balcony.	130,680	???	14	80	50
Discovery Science Center	Science based educational facility aimed at elementary students. Exhibits on paleontology and space exploration.		59,000	???	???	???	???
Dolan DNA Learning Center	Structured programming for school groups and teachers						
Gulfcoast Wonder & Imagination Zone	Teacher resource area; educational facilities; 35,000sf exhibit space; classrooms; outdoor science playground; intermuseum hook-up; 70-seat theater; gift shop	Interactive science exhibits including physical science, life science & technology; Tot Science	???	35000	10	5	125
Health World Children's Museum			85,000	38,000	26	24	361

Museum	Facilities		Total sf	Exhibits sf	FT Staff	PT Staff	Vol Staff
	Description	Collections					
Lindsay Wildlife Museum	Live display collection; classrooms; pet education section; petting circle; discovery room; wildlife hospital; gift shop	Live wild animals; taxidermied specimens; Indian artifacts; entomology; botany; marine	33,000	7500	25/28	19/17	600/409
MIT Museum	Holography lab	Architecture & Design collection: 1873-1968 student theses and projects; 1840-1920 rare drawings by European & American architects. Hart Nautical Gallery: late 19th to early 20th century New England technical history of ship & small craft design, construction & propulsion. Holography collection: 1940s inception to current artistic & technical evolution. MIT general collection: artifacts, visual & written materials documenting history of MIT & its role in the development of science, technology, & engineering. Science & Technology collection: record of 19th-20th century innovation.	39,206		10/11	6	6
National Inventors' Hall of Fame	Library on inductees' backgrounds and creativity materials; cafeteria; educational facilities; 30,000 sf exhibit space; resource center for creativity	Five exhibit tiers are dedicated to Hall of Fame inductees; concentration on individuals who conceive technological advances that America fosters through its patent system; highly interactive activities rich in tools & materials	40,000	30000	60	25	100
SciTech Hands-On Museum	Outdoor science park; gift shop	Science and technology hands-on exhibits on weather, light & color, heat, mathematics, sound & music, magnets & electricity, physics, chemistry, biology, astronomy & nuclear physics	40,000	26000	12	44/35	15/25
Water Resources Education Center	No information available	No information available					
Where two figures are given, the first is provided by The Official Museum Directory and the second by the ASTC Sourcebook of Science Center Statistics 2004.							

Financial Information

Museum	Operating Revenue	Operating Expenses	1c* Govt Contribs	10a* Sale of Goods	10b* Cost of Goods	17* Operating Expenses	25A+26A* Salaries	Form 990 year
Ann Arbor Hands-On Museum	1,803,453	1,635,964	0	243,353	122,481	1,817,101	847,864	2003
Bay Area Discovery Museum	3,217,500	3,390,150	0	91,822	48,076	5,241,370	1,788,256	2003
BNL Science Museum	-	-	-	-	-	-	-	-
Children's Science Explorium	312,340	312,340	312,340	0	0			
Cranbrook Institute of Science	2,898,296	3,883,454	-	-	-	-	-	-
Discovery Science Center	-	-	20,545	0	0	219,962	44,466	2003
Discovery Museums	-	-	14,427	22,859	10,522	957,762	609,755	2003
Discovery Science Center	-	-	560,331	369,490	115,188	3,836,209	1,445,718	2003
Dolan DNA Learning Center	-	-	-	-	-	-	-	-
Gulfcoast Wonder & Imagination Zone	-	-	70,082	77,028	96,728	2,769,973	336,604	2003
Health World Children's Museum	-	-	98,152	242,660	114,462	1,273,398	731,760	2004
Lindsay Wildlife Museum	3,032,232	2,992,079	0	0	0	3,176,804	1,339,857	2004
MIT Museum	1,149,064	991,585	-	-	-	-	-	-
National Inventors' Hall of Fame	-	-	5,319,000	0	0	5,751,505	2,539,569	2003
SciTech Hands-On Museum	1,023,317	1,017,658	288,794	40,678	24,128	1,073,512	561,458	2003
Water Resources Education Center	-	-	-	-	-	-	-	-
* These numbers refer to line numbers from the IRS form 990								
"Operating Revenue" and "Operating Expenses" figures are from the ASTC Sourcebook of Science Center Statistics 2004								

Audience Information

Museum	Attendance	$ Admission			$ Membership	
		Adult	Senior	Child	Indiv	Family
Ann Arbor Hands-On Museum	193,183	7.50	6.00	6.00	50.00	75.00
Bay Area Discovery Museum	195,000	8.50	-	7.50	75.00	95.00
BNL Science Museum	20,000	0.00	0.00	0.00	-	-
Children's Science Explorium	55,000	0.00	0.00	0.00	-	-
Cranbrook Institute of Science	158,367	7.00	5.00	5.00	50.00	65.00
Discovery Center	223,148	11.00	8.50	8.50	50.00	75.00
Discovery Museums	140,000	8.00	8.00	7.00	65.00	-
Discovery Science Center		11.00	8.50	8.50	50.00	75.00
Dolan DNA Learning Center		0.00	0.00	0.00	-	-
Gulfcoast Wonder & Imagination Zone		7.00	5.00	6.00	60.00	
Health World Children's Museum	220,000	6.00	6.00	6.00	55.00	70.00
Lindsay Wildlife Museum	111,150	0.00	0.00	0.00	25.00	
MIT Museum	74,784	5.00	2.00	2.00	-	-
National Inventors' Hall of Fame	80,000	7.50	6.00	6.00	35.00	60.00
SciTech Hands-On Museum	71,976	7.00	6.00	6.00	50.00	65.00
Water Resources Education Center		0.00	0.00	0.00	-	-

Programming

Museum	Adopt-an-Animal	Adult Programs	Affiliated Organizations	After-School Programs	Animal Feedings	Audio Tours	Behind-the-Scenes Tours	Birthday Parties	Changing Exhibitions	City walking & bus tours	Collections Accessible Online	Community Display Space	Concerts/Musical Events	Distance Learning	Elementary School Programs	Evening Hours	Facility Rental	Family Programs	Home-School Programs	Internships	Lecture Series	Outreach to Schools	Photo Contest	Pre- and Post-Visit Materials	Preschool Programs	Publications	Rental/Outreach Kits	School On-Site	School Tours	Scout/4H Programs	Seated Food Service	Senior Programs	Sleepovers/Camp-ins	Special Events	Teacher Training/Materials	Teen Programs	Topical Sales/Auctions	Travel/Trips	Traveling Exhibitions	Youth Day-Camps	Web Programming
Ann Arbor Hands-On Museum		X						X	X						X		X	X	X			X		X	X				X	X		X	X	X	X				X	
Bay Area Discovery Museum								X					X		X			X				X			X				X		X		X	X	X			X	X	X
BNL Science Museum			X												X							X							X								X		X	
Children's Science Explorium		X	X	X					X						X	X		X	X										X					X				X		
Cranbrook Institute of Science		X	X	X					X					X	X	X	X	X	X		X	X			X	X	X		X	X	X			X	X	X		X	X	X	X
Discovery Center for Science & Technology		X	X	X												X		X				X					X								X						X
Discovery Museums			X	X				X							X	X	X	X				X		X	X				X	X				X	X	X				X	
Discovery Science Center		X	X					X	X						X		X	X				X			X				X	X			X	X	X		X			X
Dolan DNA Learning Center			X						X		X											X		X											X	X				X	X
Gulfcoast Wonder & Imagination Zone		X						X							X		X	X				X				X			X	X				X		X			X	X	
Health World Children's Museum			X					X	X				X		X							X			X					X			X		X	X			X	X	X
Lindsay Wildlife Museum		X	X		X			X	X						X			X	X	X		X			X				X					X			X	X	X	X
MIT Museum		X	X						X	X	X					X	X	X		X	X								X					X		X				X
National Inventors' Hall of Fame		X	X								X				X			X						X														X	X	X
SciTech Hands-On Museum								X					X		X			X				X		X	X		X		X	X			X	X	X			X	X	
Water Resources Education Center			X		X					X					X		X	X		X		X		X	X				X	X				X	X	X				X

Explanations

Adopt-an-Animal: The public can sponsor or contribute money towards the care of a specific live animal or a type of live animal

Adult Programs: Programs/classes specifically for adults college-age or later

Affiliated Organizations: Established partnerships with related clubs, affinity groups, etc (other than the museum's Friends group)

After-School Programs: Organized programs on weekday afternoons for school-age children

Animal Feedings: Visitors can observe and/or participate in feeding of live animals

Audio Tours: Recorded tours w/headphones available for free or to rent

Behind-the-Scenes Tours: Visitors can see how the facility works; can see collections storage or animal care etc.

Birthday Parties: Facility rental with special activities just for children's birthdays

Changing Exhibitions: Develop changing exhibitions with the collections/resources

City walking & bus tours: Guided tours for visitors of a related area outside of the facility

Collections Accessible Online: Database on website with the collections accessible to the public

Community Display Space: Gallery specifically for local artists and/or collectors

Concerts/Musical Events: An established program of concerts or musical performances: summer concert series, etc

Distance Learning: Educational programs conducted via web, email, or mail

Elementary School Programs: Organized programs (not just tours) specifically for elementary school-aged children

Evening Hours: Open one evening a week or more after 5pm

Facility Rental: The public can hold an event in the facility for a fee

Family Programs: Programs for parents and children together

Home-School Programs: Educational programs developed specifically for home-schoolers

Internships: Structured experiences for high-school/university/postgrad students for educational credit

Lecture Series: An organized program of presentations, by scholars/experts, related to the collections

Outreach to Schools: Education staff travels to schools to give presentations

Photo Contest: The public can enter a juried competition

Pre- and Post-Visit Materials: Materials for teachers to use in-class before and/or after a visit

Preschool Programs: Programs developed specifically for preschool children/toddlers

Publications: Exhibition catalogues, essay collections etc (not just gallery guides/annual reports/educational leaflets)

Rental/Outreach Kits: Schools can borrow a trunk/box/packaged program to give themselves at their schools

School On-Site: An actual school, public or private, physically on the grounds

School Tours: Tours of the facility focused on specific school curricula/standards of learning

Scout/4H Programs: Scouts can earn a badge

Seated Food Service: Café, cafeteria, or restaurant (not necessarily with wait staff but more than picnic tables and vending machines)

Senior Programs: Programs or events specifically for seniors/Elderhostel

Sleepovers/Camp-ins: Kids or families spend a night in/at the facility

Special Events: Annual festivals/major events/parties put on by the organization for the public

Teacher Training/Materials: Workshops, orientations, training, or printed materials specifically for educators

Teen Programs: Programs specifically for teenagers/high school age students

Topical Sales/Auctions: Fundraising sales that relate to the collections: exotic plants; wildlife art etc.

Travel/Trips: Organized groups go on a trip together with member(s) of the staff

Traveling Exhibitions: The organizations rents or borrows exhibitions from outside sources

Youth Day-Camps: Programs for school-age children that last a half-day or more for three or more days

Web Programming: Significant resources/activities/information on web site

Appendix D

Comparable Institutions: 20,0000 square feet

Austin Children's Museum, Austin, TX
Catawba Science Center, Hickory, NC
Discovery Center of Idaho, Boise
Health Adventure, Asheville, NC
National Atomic Museum, Albuquerque, NM
ScienceWorks Hands-On Museum, Ashland, OR
South Florida Science Museum, West Palm Beach, FL
Bay Area Discovery Museum, Sausalito, CA
Health World Children's Museum, Barrington, IL
Lindsay Wildlife Museum, Walnut Creek, CA
MIT Museum, Cambridge, MA
National Inventors' Hall of Fame, Akron, OH

Austin Children's Museum
•Private nonprofit
•Founded 1983
•Building 20,000 sq ft
•Public space 9,650 sq ft
•Attendance on-site 187,996; Group on-site 15,287; Outreach 10,800
•Staff 26/35/275
•Revenue $2,945,547
•Expense $1, 731,074

Catawba Science Center, Hickory, NC
•Private nonprofit
•Founded 1975
•Building 26,000
•Public space 12,000
•Former school building
•Attendance on-site 102,000
•Staff 14/35/85
•Revenue $1,215,322
•Expense $895,371

Discovery Center of Idaho, Boise, ID
•Private nonprofit
•Founded 1986
•Building size 28,000 sq ft
•Public space 12,000 sq ft
•Attendance on-site 98,700; Group on-site 26,388; Outreach 5,305
•Staff 9/2/200
•Revenue $842,300
•Expense $895,371

The Health Adventure, Asheville, NC
•Private nonprofit
•Founded 1968
•Building size 23,000
•Public space 20,000
•Attendance on-site 84,434; Group on-site 24,015; Outreach 30,895
•Staff 15/11/265
•Revenue $849,456
•Expense $846,948

National Atomic Museum, Albuquerque, NM
•Federal, Department of Energy, transitioning to private nonprofit
•Founded 1969
•Building 22,000 sq ft
•Public space 14,000 sq ft
•Temporary facility – REI store
•Attendance on-site 80,000; Group on-site 8,500; Outreach 14,000
•Staff 14/5/65
•Revenue $1,455,000
•Expense $1,375,000

Scienceworks Hands-On Museum, Ashland, OR
•Private nonprofit
•Founded 2001
•Building originally housed the Northwest Coast Museum of Natural History
•Building size 26,000
•Public space 10,000
•Attendance on-site 50,000; Group on-site 5,000; Outreach 4,000
•Staff 5/5/150
•Revenue $557,570
•Expense $552,285

South Florida Science Museum, West Palm Beach, FL
•Private nonprofit
•Founded 1959
•Building 22,000
•Public Space 15,000
•Attendance on-site 114,000; Group on-site 27,185; Outreach 22,306
•Staff 25/15/200
•Revenue $1,598,402
•Expense $1,576,632

Bay Area Discovery Museum, Sausalito, CA
•Private nonprofit
•Building 51,2140
•Public Space 21,955
•Attendance on-site 195,000
•Staff 30/45/70
•Revenue $3,217,500
•Expense $3,390,150

Health World Children's Museum
•Private nonprofit
•Building 85,000
•Public Space 38,000
•Attendance on-site 220,000
•Staff 26/24/361

Lindsay Wildlife Museum, Walnut Creek, CA
•Private nonprofit
•Building 33,000
•Public Space 7,500
•Attendance on-site 111,150
•Staff 28/19/600
•Revenue $3,032,232
•Expense $2,992,079

MIT Museum, Cambridge, MA
•Massachusetts Institute of Technology
•Building 39,206
•Attendance on-site 74,784
•Staff 11/6/6
•Revenue $1,149,064
•Expense $991,585

National Inventors' Hall of Fame, Akron, OH
•Private nonprofit
•Building 40,000
•Public Space 30,000
•Attendance on-site 80,000
•Staff 60/25/100
Revenue
Expense
Camp Invention national program

Basic Information

Museum	Location	MSA Pop	Governance	Mission Statement
Austin Children's Museum	Austin, TX	1,249,763	independent nonprofit	Our mission is to inspire young children and the adults in their lives to experience the joy of learning through the power of constructive play.
Catawba Science Center	Hickory, NC	341,851	independent nonprofit	Provide a hands on learning environment for science and nature
Discovery Center of Idaho	Boise, ID	432,345	independent nonprofit	The Discovery Center of Idaho provides experiences and educational opportunities that inspire lifelong learning and interest in science, math, and technology, and that supplement and enrich formal science education through interactive exhibits, educational programs, and teacher resources.
Health Adventure	Asheville, NC	225,965	independent nonprofit	Health education
National Atomic Museum	Albuquerque, NM	712,738	Federal	The mission of the National Atomic Museum is to serve as America's resource for nuclear history and science. The Museum presents exhibits and quality educational programs that convey the diversity of individuals and events that shape the historical and technical context of the nuclear age.
ScienceWorks Hands-On Museum	Ashland, OR	181,269	independent nonprofit?	To inspire wonder and stimulate exploration of the world around us through fun interactive science.
South Florida Science Museum	West Palm Beach, FL	1,131,184	independent nonprofit	The mission of the South Florida Science Museum is to excite curiosity and further the understanding and appreciation of science and technology.
Sources: The Official Museum Directory (AAM); ASTC Sourcebook of Science Center Statistics 2004; organizations' web sites				

Staff & Facilities

Museum	Facilities		Total sf	Exhibits sf	FT Staff	PT Staff	Vol Staff
	Description	Collections					
Austin Children's Museum	7800 sq. ft. exhibit space. Gift shop	folk culture	20,000	7,800 (9,560)	26	35	275
Catawba Science Center	Permanent and traveling exhibits spaces, gift shop.	teaching collections	26,000	12,000	14	35	85
Discovery Center of Idaho	educational facilities; portable, inflatable planetarium. Gift shop.	teaching collections	26,800	12,000	9	2	200
Health Adventure	20,000 sq. ft. exhibit space; 70-seat theatre; 60-seat theater, classrooms; traveling exhibits. Gift shop.	bones; nutrition, digestion, muscles, circulation, dental, respiration; life patterns; substance abuse; brains; senses; creativity; sports health; general anatomy; transparent anatomical mannequin.	23,006	20,000 (9,175)	15	11	265
National Atomic Museum	library of books and photographs on the history of nuclear weapons & various energy programs available on premises; exhibits relating to nuclear weapons history; current & future nuclear energy programs; theater.	nuclear weapon cases & related materials; nuclear medicine; weapons; history of the atom	22,000	14,000	14	5	65
ScienceWorks Hands-On Museum	10,000 sq. ft. exhibit space. Gift shop.	teaching collections	26,000	10,000	5	5	150
South Florida Science Museum	planetarium; discovery room; observatory; aquarium; auditorium; exhibit hall	natural history; paleontology; archaeology; astronomy; geology; concology	22,000	15,000	25	15	200
Sources: The Official Museum Directory (AAM); ASTC Sourcebook of Science Center Statistics 2004; organizations' web sites							

Financial Information

Museum	Operating Revenue	Operating Expenses	1c* Govt Contribs	10a* Sale of Goods	10b* Cost of Goods	17* Operating Expenses	25A+26A* Salaries	Form 990 year
Austin Children's Museum	2,495,537	1,731,074	73,154	171,261	86,672	2,218,656	853,075	2003
Catawba Science Center	1,215,322	988,252	140,622	59,056	46,107	1,046,555	551,289	2004
Discovery Center of Idaho	842,300	895,371	25,000	158,040	56,246	831,218	339,597	2004
Health Adventure	849,456	846,948	296,978	25,060	19,742	935,070	501,505	2003
National Atomic Museum	1,455,000	1,375,000	0	216,986	158,380	793,738	332,714	2003
ScienceWorks Hands-On Museum	557,570	552,285	72,525	13,840	5,887	551,867	338,122	2003
South Florida Science Museum	1,598,402	1,576,632	87,500	58,784	63,182	1,955,103	963,667	2003
* These numbers refer to line numbers from the IRS form 990								
"Operating Revenue" and "Operating Expenses" figures taken from ASTC Sourcebook of Science Center Statistics, 2004								

Audience Information

Museum	Attendance	$ Admission			$ Membership	
		Adult	Senior	Child	Indiv	Family
Austin Children's Museum	438,201	5.50	0	3.50	0	75.00
Catawba Science Center	102,000	4.00	2.00	2.00	40.00	55.00
Discovery Center of Idaho	98,700	6.00	5.00	3.50	25.00	50.00
Health Adventure	120,532	5.00	4.00	0.00	30.00	60.00
National Atomic Museum	80,000	4.00	3.00	3.00	25.00	50.00
ScienceWorks Hands-On Museum	50,000	7.50	5.00	5.00	60.00	60.00
South Florida Science Museum	114,000	7.00	0	4.00	35.00	55.00
Sources: The Official Museum Directory (AAM); ASTC Sourcebook of Science Center Statistics 2004; organizations' web sites						

Programming

Museum	Adopt-an-Animal	Adult Programs	Affiliated Organizations	After-School Programs	Animal Feedings	Audio Tours	Behind-the-Scenes Tours	Birthday Parties	Changing Exhibitions	City walking & bus tours	Collections Accessible Online	Community Display Space	Concerts/Musical Events	Distance Learning	Elementary School Programs	Evening Hours	Facility Rental	Family Programs	Home-School Programs	Internships	Lecture Series	Outreach to Schools	Photo Contest	Pre- and Post-Visit Materials	Preschool Programs	Publications	Rental/Outreach Kits	School On-Site	School Tours	Scout/4H Programs	Seated Food Service	Senior Programs	Sleepovers/Camp-ins	Special Events	Teacher Training/Materials	Teen Programs	Topical Sales/Auctions	Travel/Trips	Traveling Exhibitions	Youth Day-Camps	Web Programming
Austin Children's Museum				X				X	X			X	X		X	X	X	X							X				X	X			X	X	X				X	X	
Catawba Science Center		X	X		X			X	X						X		X	X	X			X			X		X		X			X	X	X	X	X			X	
Discovery Center of Idaho		X	X		X			X	X						X				X					X					X					X	X				X	
Health Adventure			X	X				X							X		X	X	X			X		X	X		X		X					X	X	X			X	X	
National Atomic Museum			X					X	X						X		X					X							X						X	X		X		X	
ScienceWorks Hands-On Museum			X						X						X		X	X				X			X				X					X	X	X					
South Florida Science Museum					X		X	X							X	X	X	X	X			X		X					X					X		X		X	X	X	
Sources: The Official Museum Directory (AAM); ASTC Sourcebook of Science Center Statistics 2 4; organizations' web sites																																								

Explanations

Adopt-an-Animal: The public can sponsor or contribute money towards the care of a specific live animal or a type of live animal

Adult Programs: Programs/classes specifically for adults college-age or later

Affiliated Organizations: Established partnerships with related clubs, affinity groups, etc (other than the museum's Friends group)

After-School Programs: Organized programs on weekday afternoons for school-age children

Animal Feedings: Visitors can observe and/or participate in feeding of live animals

Audio Tours: Recorded tours w/headphones available for free or to rent

Behind-the-Scenes Tours: Visitors can see how the facility works; can see collections storage or animal care etc.

Birthday Parties: Facility rental with special activities just for children's birthdays

Changing Exhibitions: Develop changing exhibitions with the collections/resources

City walking & bus tours: Guided tours for visitors of a related area outside of the facility

Collections Accessible Online: Database on website with the collections accessible to the public

Community Display Space: Gallery specifically for local artists and/or collectors

Concerts/Musical Events: An established program of concerts or musical performances: summer concert series, etc

Distance Learning: Educational programs conducted via web, email, or mail

Elementary School Programs: Organized programs (not just tours) specifically for elementary school-aged children

Evening Hours: Open one evening a week or more after 5pm

Facility Rental: The public can hold an event in the facility for a fee

Family Programs: Programs for parents and children together

Home-School Programs: Educational programs developed specifically for home-schoolers

Internships: Structured experiences for high-school/university/postgrad students for educational credit

Lecture Series: An organized program of presentations, by scholars/experts, related to the collections

Outreach to Schools: Education staff travels to schools to give presentations

Photo Contest: The public can enter a juried competition

Pre- and Post-Visit Materials: Materials for teachers to use in-class before and/or after a visit

Preschool Programs: Programs developed specifically for preschool children/toddlers

Publications: Exhibition catalogues, essay collections etc (not just gallery guides/annual reports/educational leaflets)

Rental/Outreach Kits: Schools can borrow a trunk/box/packaged program to give themselves at their schools

School On-Site: An actual school, public or private, physically on the grounds

School Tours: Tours of the facility focused on specific school curricula/standards of learning

Scout/4H Programs: Scouts can earn a badge

Seated Food Service: Café, cafeteria, or restaurant (not necessarily with wait staff but more than picnic tables and vending machines)

Senior Programs: Programs or events specifically for seniors/Elderhostel

Sleepovers/Camp-ins: Kids or families spend a night in/at the facility

Special Events: Annual festivals/major events/parties put on by the organization for the public

Teacher Training/Materials: Workshops, orientations, training, or printed materials specifically for educators

Teen Programs: Programs specifically for teenagers/high school age students

Topical Sales/Auctions: Fundraising sales that relate to the collections: exotic plants; wildlife art etc.

Travel/Trips: Organized groups go on a trip together with member(s) of the staff

Traveling Exhibitions: The organizations rents or borrows exhibitions from outside sources

Youth Day-Camps: Programs for school-age children that last a half-day or more for three or more days

Web Programming: Significant resources/activities/information on web site

Appendix E

Rockville Science Day Audience Survey

About fifty Rockville Science Day visitors took the time to fill out a brief survey regarding their experience at Science Day, their interest in a permanent science center located in Rockville, and specific thoughts about content and presentation in that center.

As is the case with all on-site surveys, the participants are a self-selected group, so the results are not representative of the broad population.

Several surveys mentioned familiarity with the Science Museum of Virginia and the Maryland Science Center.

Science Day participants noted the desirability of exposing children to various aspects of science, both in a social setting with their parents and as a supplement to what they are exposed to in school. They like the variety of demonstrations and hands-on activities. Participants noted enjoying seeing the applications of science (e.g. solar power in electric vehicles), conversing with Dr. Stonestreet, touching the reptiles, digging for insects, and working with robots and rockets.

There is a high degree of interest in the development of a science center facility in Rockville.

Several topics were mentioned as being desirable:

- Animals, nature and the environment
- Physics and chemistry experiments
- Astronomy
- Weather
- Recycling.

Survey respondents also mentioned some presentation and experience qualities:

- Hands-on/interactive exhibits
- Contact with “real” scientists
- Project-based activities
- Materials for advanced as well as beginning students
- Programs that complement what is offered in the schools.

Appendix F

Exhibitors at Rockville Science Day, 2000-2005

Organization	Topic	Presenter	2000	2001	2002	2003	2004	2005
American Assoc. for the Advancement of Science	Kinetic City	B. Hirshon				X	X	
American Association of University Women	Awards Ceremony		X	X	X	X	X	X
American Association of University Women	Fascinating Fossils	Laurel M. Bybell	X					
American Association of University Women	Information Desk	Sandra Menzies		X				
American Association of University Women	Women in Science	A. Richey			X	X		
American Association of University Women	Role of AAUW prom women	S. Chan, S. Menzies	X					
Advanced Building Performance	Green Buildings etc	P. Tseng						X
American Red Cross	Blood Cells and Immunity	Donna Sobieski		X				
Animal Exchange	Various	Ruth Hanessian	X	X		X		
Animal Exchange	From Egg to Feathers	R. Hanessian						X
Audubon Naturalist Society	It's a Small World	Jane Huff	X					
Audubon Naturalist Society	Soil Critters	Bill Swan		X				
Audubon Naturalist Society	Wonders of Natural Science	A. Vernor			X	X		
Audubon Naturalist Society	It's the Little Things that Count	H. Chalbut						X
Audubon Naturalist Society	Explore the Natural World	Andrea Merritt					X	
Astronomy to go	Various	Bob Summerfield	X	X	X			
Beltsville Human Nutrition Research	Chromium & Prevention Diabetes	Richard Anderson	X					
City of Rockville	Croydon Creek	Emily Beach					X	
City of Rockville	Croydon Creek	Betsy Thompson	X	X				
City of Rockville	Croydon Creek	Valerie Oliver				X		
City of Rockville	Watts Branch Watershed study	Lise Soukup		X				
City of Rockville	Watershed Management	P. Rowe				X	X	
City of Rockville		N. Wall						X
City of Rockville	GIS	Pedro E. Flores	X	X	X	X	X	
Dept. Phys., Earth Sci & Eng., Mont Coll.	Various	Terry Dyroff	X		X	X		

Organization	Topic	Presenter	2000	2001	2002	2003	2004	2005
Department of Chemistry, Montgomery Coll.	Funny Putty	T. Watt, T. Tayman	X					
Department of Chemistry, Montgomery Coll.	Funny Putty	Sue Thornton		X				
Department of Chemistry, Montgomery Coll	Chemistry in Your Kitchen	T. Watt, T. Tayman		X	X	X	X	X
Department of Chemistry, Montgomery Coll.	Chemistry Can Be Illuminating	T. Watt, L. Rogness			X	X	X	X
Department of Chemistry, Montgomery Coll.	Chemistry	T. Watt, T. Tayman	X	X				
Department of Chemistry, Montgomery Coll.	Chemistry	John C. Hoffsommer		X	X		X	X
Department of Chemistry, Montgomery Coll.	Chemistry	W. Grant, N. Tahmazian	X	X				
Department of Chemistry, Montgomery Coll.	Chemistry	N. Tahmazian, C. Schick			X	X	X	X
Department of Chemistry, Montgomery Coll.	Acids and Bases	J. Hoffsommer				X		
Dinosaur Fund	Dinosaurs in Maryland	Peter Kranz					X	
Discovery Toys	Learning Science thru Play	Christine Yankus-Eng	X					
EDVOTEK	Biotechnology-Fun Stuff!	A. Patel			X			
EDVOTEK	Biotechnology Games	D. Leader				X		
Electric Vehicle Assoc Greater Washington	Jr. Solar Sprint Model Wksp	Charlie Garlow	X	X			X	X
Electric Vehicle Assoc Greater Washington	The Electric Car & Solar Cars	D. Goldstein, C. Garlow	X	X	X	X		X
Essential Fats	Food & Fats for Health Brains	E. Siegel						X
Explore-It-All Science Center	Building Bridges	Karen Ruben-Hamilton		X				
Galaxy Scouts	Launching Pioneers 21st Cen	N. Eftimiades			X	X	X	
Gem, Lap & Mineral Soc of Mont Co	Maryland Gold and Minerals	Jack Nelson	X		X			
Gem, Lap & Mineral Soc of Mont Co	Mineralogy: Rock On!		X					
Gem & Mineral Soc of Mont Co	Rocks & Minerals around us	M. & J. Michaelis		X	X	X		X
Howtheweatherworks	Sky's the Limit	M Mogil, B Levine	X					
Howtheweatherworks	Punxsutawney Phil	M Mogil, B Levine		X				
Howtheweatherworks	Watershed Workings	M.Mogil, B.Levine, J.Huff			X	X		
Howtheweatherworks	Cloud Stamps 2004	M. Mogil					X	
Howtheweatherworks	Where does rain come from	M. Mogil						X
Islamic Saudi Academy, Alexandria, VA	Fairfax Co. Sci/Eng School Fair	M. Fahmy			X			
The Internet Society		John Morada	X					
Lockheed Martin	Get Ready for Space Day	R. Eckman	X					
Lockheed Martin Explorer Post	Linux Live!		X					

Organization	Topic	Presenter	2000	2001	2002	2003	2004	2005
Lockheed Martin Explorer Post	Robots	R. Eckman		X	X	X	X	X
Lockheed Martin plus	Environmental Radiation	D. Fowler, M. A. Ettawageshik		X				
Locust Grove & Brookside Nat Centers	Who Lives Here?	L. Sturges					X	X
MD Alliance for Greenway Improvement & Conservation	Reconnecting the Environment	Bob DeGroot		X	X	X	X	X
Mars Society	Future Space	T. Hill, R. Terry				X	X	X
Maryland Geological Survey	Unique Geological Features	D. Sheldon					X	X
Meadowside Nature Center	Go Bats!	L. Sturges			X			
Mike Rocke	The Songs of Science	M. Rocke			X			
Montgomery Amateur Radio Club	Amateur Radio	Fred Atkinson		X				
Montgomery Amateur Radio Club	Amateur Radio	L. Vallin			X		X	X
Montgomery Amateur Radio Club	Amateur Radio	F. Bader, A. Rabassa				X		X
Montgomery Bird Club	Maryland Bird Atlas	K. Stewart						X
Mont. Coll. Computer Science Club	Computers over time	Patricia Secreto	X	X	X	X	X	X
MC Cemetery Inventory & Peerless Rvle	Cemetery Science	A. Bracket & M. Cummings					X	
Mont. Co. Division of Solid Waste	Montgomery County Recycles	Eileen Kao	X	X				
Mont. Co., Division Solid Waste	Recycling in MC	E. Kao, M.L. McQuaide			X	X	X	X
Montgomery Co Solid Waste Transfer	Vermiculture: Indoor Composting	Jim Welch		X				
Montgomery Co. Hist. Soc.	Beginning of Modern Medicine	C. Hickey						X
Montgomery Group Sierra Club	Various	R. LaCoss				X	X	X
Moon Society, Mid-Atlantic Chapter	Commercial Exploration on Moon	R. Severy				X	X	
Nat'l Assc. of Rocketry HQ Astro Modeling, Sect. #139	Rocket-Building	Ed Pearson	X	X	X	X	X	X
Nat'l Center for Nutrition	Foods & Fats for Healthy Brains	E. Seguel				X		
Nature Education for Science Teachers & Students	Ten-Gallon Habitats	J. Huff, R. Hanessian			X		X	
Nat'l Institute of Standards & Technology	Toward Metric America	Linda Crown	X	X	X			
Nat'l Institute of Standards & Technology	NIST at 100	Jennifer Wright		X				
Nat'l Institute of Standards & Technology	Making Technology Better	J. Wright, G. Porter				X		
Nat'l Institute of Standards & Technology	Great Grape Soda Race	M. Satterfield, K. Rimmer				X	X	
Nat'l Oceanic & Atmospheric Administration NOAA	Satellite Views of Earth	David McGinniss	X	X				
PEPCO	Visiting Truck	Jon Rogers	X			X		

Organization	Topic	Presenter	2000	2001	2002	2003	2004	2005
PEPCO	Visiting Truck	Dane Merkel		X				
Peerless Rockville	Rockville's Role in Innovation	Maizie Rocke		X				
Peerless Rockville	Historic Weather Patterns	R. Schwartz, M. Cummings-Rocke			X			
Peerless Rockville	Science of Cemeteries	M Cummings						X
Physiotherapy Associates	Physical Therapy	Adrienne McAuley		X				
Planetarium, Mont. Coll., Takoma Park	Various	Harold Williams	X	X	X	X		X
Rave Family	Beall Elem Sch Science Expo	Rave family			X			
Reptile Wonders	Reptile Wonders	Brian Kristal		X	X	X	X	X
Retired Scientists, Engineers & Technicians (ReSET)	Scientists in the Classroom	Harold Sharlin		X				
Rockville Community Network	Rocknet	Robert Eckman	X	X	X	X	X	X
Rockville Police & Croyden Creek	Wild Science Fair	P. Colbert, E. Beach						X
Rockville Sci, Tech, & Env Commission	Brain vs. Computer	Hala Jarrar	X					
Rockville Sci, Tech, & Env Commission	Community Link to Science	Michael Hirsch		X				
Second Chance Wildlife Center		Mira Miller	X	X				
The Institute for Genomic Resesarch	The Institute for Genomic Res.	Lisa McDonald	X		X	X	X	
U MD Biotechnology Institute	Advancing Biotechnology	G. Coleman			X			
U.S. Geological Survey	Fascinating Fossils	L. Bybell			X			X
Washington Area Butterfly Club	Butterflies in Your Backyard	Barbara Farron		X				
	Astronomical Spectroscopy	Andrew Secord	X					
	Forearm splint, carpal tunnel	Richard F. Singer	X					

Appendix G

Local Science Resources

Maryland Science Center

The Maryland Science Center is a full-service science center with a planetarium, rooftop observatory, Imax theater, motion simulator, laser theater, and a science demonstration stage. In addition, it also has an early childhood area. It regularly brings in national-level major traveling exhibitions. A new and prominent gallery features dinosaurs – how do we know about them and which one(s) were in Maryland? This is very much an inquiry-based exhibition, different from the usual factually-based paleontology exhibition. Montgomery County is the third highest source of school group visits to the Maryland Science Center. In 2004-05, 4,598 Montgomery county students visited the Maryland Science Center, while In addition, the Maryland Science Center offers outreach classroom, assembly and Starlab programs for grades 2-12. These programs reached 130,000 students in 2003-2004. In 2004-05, 10,281 students and teachers received outreach at Montgomery County schools and libraries. There are nine assembly programs, eight classroom programs, and five Starlab programs. Most outreach programs focus on physics, chemistry, and astronomy though there are some on biology, earth science, and math. Teachers attending ten Teachers' Thursdays programs earn one Maryland State Department of Education Continuing Professional Development Credit. Almost 15% of the teachers participating in professional development activities come from Montgomery County.

Baltimore Museum of Industry

This history museum focuses on the industrial and economic history of Baltimore and the immediate region. Approximately 33% of its school visits come from Montgomery County.

The Museum of Industry houses the Maryland Center for Career and Technology Education Studies. This group hosts a series of Engineering Challenge Competitions. This is a series of competitions for groups of pupils in grades 1-12, sponsored by the Engineering Society of Baltimore, the Baltimore Museum of Industry, the Technology Education Association of Maryland, and the TIME (Technology and Innovation in Manufacturing Education) Center with the objective of introducing young people to the role of the engineer in today's society. The competitions have four main components, a written report (sent in two weeks in advance), an oral report, the design and construction of the entry, and its performance at the Museum of Industry. Most entries are from schools, both private and public, but can come from clubs of all types, or even individual families. In 2000-2005, there are three regular challenges at the Elementary School level, five at the Middle School level, and four at High School level. The museum estimates that approximately 1/3 of the 1,500 students who participate in the competitions are from Montgomery County.

Smithsonian Museums

Science in various forms at the National Museum of Natural History, the National Air and Space Museum, the National Museum of American History, the National Zoo, The National Arboretum, the National Botanical Garden.

Howard B. Owens Science Center

The Howard B. Owens Science Center, (HBOSC), a 27,500 square foot facility owned and operated by the Prince George's County Public Schools, has as its mission "to provide excellence in science and technology education through student centered programs and services". The Center provides K-12 students with opportunities to participate in unique activity-based science instruction. HBOSC uses teacher developed curriculum materials that approach science literacy from the perspective of developmental, exploratory learning. Textbooks are never used except by program developers as references for consistency with county curriculum. Hands-on, data intensive activities provide students with experiences in physics, chemistry, physiology, biology, space science education, paleontology, meteorology, optics, nutrition, computer science, and astronomy. Teachers on site continuously develop new programs and update current offerings.

Approximately 90,000 students visit the Center annually. The Center serves students with special needs as well as gifted and Advanced Placement science students. Course offerings range from 1.5 hours to 4.5 hours. These offerings are made available through prescheduled class visitations by public schools, private schools and parochial schools (only on days when the Center is not in use by the PG County schools – e.g., testing days); programs for the general public and weekend groups; and summer enrichment classes. Girl Scouts and Brownies of the National Capitol Area account for nearly 5,000 participants through our Saturday merit badge enrichment programs.

The only permanent planetarium in Prince George's County is located at the Owens facility. The planetarium is used primarily to teach astronomy, but HBOSC also finds uses in other subject areas. The 15 m diameter dome theater seats 174 persons. The Center houses the Challenger Learning Center (CLC), a simulated space environment including a mission control and space station. It is part of a national network of sites developed as a living memorial to the memory of the seven Challenger astronauts.

The extensive Nature Trail provides students a chance to learn in an outdoor setting. In addition, a number of courses are supported by freestanding exhibits featuring arthropods and reptiles such as snakes, turtles, and alligators. There are about 2500 square feet devoted to a variety of exhibits.

Lathrop E. Smith Environmental Education Center

The Lathrop E. Smith Environmental Education Center is located on Meadowside Lane west of MD 115. It is one of three environmental education sites operated by the Montgomery County Public Schools. It provides day programs and 3-day, 2-night residential programs for 6th graders. The facility includes a modest planetarium (14' dome) and observatory plus an 80-foot Observation Tower. The Smith Center occupies 450 acres in Rock Creek Regional Park. Meadowside Nature Center is nearby and often is packaged with the Smith Center. Programs include Watershed/Aquatics, Confidence Course, Wildlife, Local History, Ecology, Orienteering, and Predator-Prey.

Marian Koshland Science Museum

The Marian Koshland Science Museum is the public education face of the National Academy of Sciences. Opened in 2004, it occupies 6,000 square feet in a downtown Washington office building at the corner of 6th and E Streets, NW. The exhibitions and programs reflect research programs of NAS. Current exhibitions feature *Global Warming*, the *Wonders of Science*, and *Putting DNA to Work*. Student programs aimed at middle and high school are available by advance reservation only. Hands-on public demonstrations are offered on weekends. Evening events (@2/month) are presented for students, interns, young professionals with pizza and beer an inducement. These were offered on an experimental basis in the museum's first year; they are successful and more are being offered in 2006.

Explorers Hall, National Geographic Society

This free museum occupies the first floor of the National Geographic Society's headquarters building on 17th Street in downtown Washington, DC. In addition to permanent galleries that reflect the richness and diversity of our world, Explorers Hall has a regular diet of temporary shows, both developed from their own resources (photos, magazine) and national traveling exhibitions (*Cats: Wild to Mild*; *Robot Zoo*; *When the Dinosaurs were Gone*), and materials from their scientists in residence (e.g., dinosaur paleontologist Paul Sereno). It reports an annual attendance of about 177,000. The National Geographic Society offers many lectures and seminars, some associated with exhibitions.

Discovery Creek Children's Museum

Discovery Creek operates the Schoolhouse, on MacArthur Boulevard in DC as well as The Stable at Glen Echo Park. The Schoolhouse, Discovery Creek's original site, includes 12 acres of hardwood forest, hiking trails, natural rock outcroppings, and a meandering creek. All programs take place inside the Schoolhouse and outside on the trails, and are aligned with the National Science Standards. The Stable features Discovery Creek's eco-immersion exhibitions, hiking trails to Minnehaha Creek, and a beautiful Children's Garden complete with an underground tunnel, aquatic habitats, giant sandpit, and a tree house.

The Rolling Rainforest is Discovery Creek's national outreach program. A 53-foor tractor trailer is themed as a neotropical rainforest with species from Brazil, Peru, Ecuador, and Central America. Programs focus on ecology, and environmental studies.

The Museum provides innovative science and environmental education programs for Kenilworth Elementary School students and teachers at Kenilworth Aquatic Gardens located on the Anacostia River in Northeast Washington, DC.

National Children's Museum

Formerly known as the Capital Children's Museum, that facility closed in August 2004. The Capital Children's Museum (CCM) is building a new state-of-the-art National Children's Museum as the centerpiece of a major new commercial development at L'Enfant Plaza in Southwest Washington, DC. The site lies two blocks south of the Mall and sits on top of the largest station in the city's Metrorail system. The National Children's Museum will be housed in a new 140,000-square-foot, state-of-the-art facility which will open in 2008. In the meantime, it is operating as a museum without walls. The capital cost of this initiative is approximately $100,000,000.

Federal Agencies and Labs
National Institutes of Heath (NIH) DeWitt Stetten Museum of Medical Research

The NIH History Office works with all NIH components to foster documentation, preservation, and interpretation of the history of the National Institutes of Health. The DeWitt Stetten, Jr., Museum of Medical Research collects, preserves, and interprets biomedical research instruments and technologies related to the work of the NIH, and non-scientific objects which place the NIH in historical and cultural context.

The Stetten Museum has two small exhibits on display in NIH's Building 10, the Warren Grant Magnuson Clinical Center. Exhibits in the Clinical Center are available for viewing from morning to evening daily. *The Stadtman Way: A Tale of Two Biochemists at NIH* and *Marshall Nirenberg: Discovering the Genetic Code* both are based on NIH research. The Stetten Museum also displays scientific instruments and other objects from its collection in several buildings on the NIH campus in Bethesda. There is no charge for admission.

The Stetten Museum coordinates with the NIH Office of Science Education, which provides extensive health- and medical-related teacher materials and resources.

National Library of Medicine, NIH

The National Library of Medicine (NLM), on the campus of the National Institutes of Health in Bethesda, Maryland, is the world's largest medical library. The Library collects materials in all areas of biomedicine and health care, as well as works on biomedical aspects of technology, the humanities, and the physical, life, and social sciences. The collections stand at more than 7 million items--books, journals, technical reports, manuscripts, microfilms, photographs, and images. Housed within the Library is one of the world's finest medical history collections of old and rare medical works. The Library's collection may be consulted in the reading room or requested on interlibrary loan. The NLM is a national resource for all U.S. health science libraries through a National Network of Libraries of Medicine®.

National Museum of Health and Medicine

The National Museum of Health and Medicine, a division of the Armed Forces Institute of Pathology, was founded as the Army Medical Museum in 1862 to study and improve medical conditions during the American Civil War. The Museum houses a collection of over one million items including archival materials, anatomical and pathological specimens, medical instruments and artifacts, and microscope slide-based medical research collections. The collections focus particularly on the history and practice of American medicine, military medicine, and current medical research issues. Today the Museum floor features exhibits on Civil War medicine including artifacts documenting the death of Abraham Lincoln; evolution of the microscope and medical instruments; a hologram of the human body and a computer interactive station of the anatomy allowing visitors to view the human body from a 3-D perspective.

The museum is part of the Walter Reed Army Medical Center, so access is restricted. It offers several different student tours, aimed at older students grades 5 and up. Saturdays feature docent-led public drop-in tours. There are periodic public programs/workshops – e.g., National History Day, Brain Awareness Week, Forensics, Germ Fest, etc. The museum is partially federally funded through the Office of Health Affairs within the U.S. Department of Defense, as well receiving grants, contributions, donations, and in-kind gifts. The museum operates an active speaker's Bureau from its Anatomical Collections and Historical Collections.

National Institute of Standards and Technology

Despite the stringent security measures post-9/11, NIST still offers guided class tours of its facilities.

College Tours consist of visits to three NIST labs. The tours are geared toward the students' area of study, such as engineering, physical science, mathematics, and computer science. Each tour can accommodate up to 30 students.

10th-12th Grade guided two-hour tours consist of visits to three labs. The tours are geared toward the students' area of study or interest. Each tour can accommodate up to 30 students.

8th-9th Grade guided tours consist of visits to three labs and are specifically geared for this age level, with lively demonstrations and hands-on involvement. Each tour can accommodate up to 30 students.

NIST's Center for Neutron Research (NCNR) offers a special tour of its facilities specifically tailored for high school science classes. Groups of up to 40 can be accommodated for the introductory lecture and tour that take about two hours. The emphasis is on how neutrons are used to probe the sub-microscopic structures and

molecular motions that determine the properties of materials ranging from concentrate to cell membranes.

National Park Service
Rock Creek Park Nature Center

The new, permanent Nature Center was opened on June 4, 1960. It is the major information center and focal point for activities related to the park's natural and cultural history. Exhibits tell about the park's wildlife and forest, and a library, open to all, has many books on natural history. A Discovery Room encourages hands-on activities. An observation beehive is located on the back wall of the exhibit room. Visitors watch the bees at work in the hive, visible through glass panes. The hive is connected to the outdoors by a plastic tube.

Guided nature walks and curriculum based environmental education programs are scheduled daily. The Center instills an affection for wild places, the ability to find a sense of wonder in them, and discover the joys of the outdoors. Programs teach the concepts of ecology, to identify the local flora and fauna, and to understand man's interrelationship with nature. The Center and all programs are accessible to wheelchairs.

The Rock Creek Park Nature Center recently received a $500,000 grant from Howard Hughes Medical Institute to develop an educational partnership among six national parks in the Washington, D.C., metropolitan area, two school systems, several nonprofit organizations and a university.

Basic Information

Museum	Location	Telephone	Web site	Governance	Mission Statement
DeWitt Stetten Museum of Medical Research	Bethesda, MD	(301) 496-6610	www.history.nih.gov	Federal govt. (NIH)	The Office of NIH History works with all NIH components to foster documentation, preservation, and interpretation of the history of the National Institutes of Health. The Historical Research Unit collects and preserves papers, photographs, and audio-visual materials, while the Stetten Museum collects, preserves, and interprets biomedical research instruments and technologies related to the work of the NIH, and non-scientific objects which place the NIH in historical and cultural context.
Howard B. Owens Science Center	Lanham, MD	(301) 918-8750	www.pgcps.org/~hbowens	Prince George's County Public Schools	to provide excellence in science and technology education through student centered programs and services. The Center seeks to provide students in grades K-12, with opportunities to participate in unique activity-based science instruction.
Lathrop E. Smith Environmental Education Center	Rockville, MD	(301) 924-3123	www.mcps.k12.md.us/schools/lathropsmith/	Montgomery Public School system	The center provides teacher-training activities that include classes and workshops emphasizing environmental studies and their application to teaching in the out-of-doors as well as in the classroom.
Marian Koshland Science Museum	Washington, DC	(202) 334-1201	www.koshlandsciencemuseum.org	independent non-profit	The Marian Koshland Science Museum features state-of-the-art exhibits that present the complexities of science in an engaging and accessible way to the general public.
Maryland Science Center	Baltimore, MD	(510) 685-5225	www.mdsci.org	independent non-profit	The mission of the MSC is to stimulate and cultivate awareness, interest, and understanding of science for all residents of and visitors to Maryland through excellent and exciting educational programs and exhibits, and to be a regional resource and a national model for science education.
National Geographic Museum at Explorers Hall	Washington, DC	(202) 857-7588	www.nationalgeographic.com/explorer/map.html	independent non-profit	
National Museum of Health and Medicine	Washington, DC	(202) 782-2200	www.nmhm.washingtondc.museum	Federal govt. (DOD: Armed Forces Institute of Pathology)	National Museum Of Health And Medicine Foundation was founded in 1989 by C. Everett Koop, M.D. to revitalize and relocate its Museum to the National Mall in Washington, enabling it to become a central resource for health promotion and education, science

Staff & Facilities

Museum	Facilities		Total sf	Exhibits sf	FT Staff	PT Staff	Vol Staff
	Description	Collections					
DeWitt Stetten Museum of Medical Research	Library of reference books, available to public with prior arrangement; educational facilities; 250-seat auditorium; 1,500-seat cafeteria; accessible from subway stop; documents, photographs	20th-21st century biomedical research instruments& technologies; history of NIH; NIH memorabilia			2	3	3
Howard B. Owens Science Center	174-seat planetarium; classrooms; laboratory; demonstration area; Challenger Learning Center	interactive exhibits & instructional programs for the Prince George's Co. Public School System			18		
Lathrop E. Smith Environmental Education Center					14		7
Marian Koshland Science Museum	5,000 sq. ft. exhibit space	science, engineering, medicine		5000	10	1	6
Maryland Science Center	400-seat Imax theater; 140-seat Davis Planetarium; 135 seat live Boyd Theatre; classrooms; laboratories; observatory; meeting rooms. Gift-shop.	participatory exhibits on space; earth science; human body; early childhood education; science arcade; Hubble space telescope; Beyond Mathematics Numbers exhibits			96	105	175
National Geographic Museum at Explorers Hall	65,000-vol. Library of geography oriented books available for research on premises; reading room; map collection; auditorium. All National Geogr aphic Society publications and maps for sale.	paleontology; aeronautics; natural history; anthropology; meteorology; archaeology; marine, land & space exploration; astronomy; Indian artifacts; archives; photographs; geography		6000	11(111)	1	100(135)
National Museum of Health and Medicine	research library of books & periodicals on medicine, medical research & public health; Otis Historical Archives; two million document medical archive; facilities for visiting scholars; 110 seat auditorium.	anatomy, anthropology; forensic sciences; history and sociology of medical science & technology; materia medica; medical research; military medicine; parasitiology; pathology; paleopathology; public health			21		12
Where two figures are given, the first is provided by The Official Museum Directory and the second by the ASTC Sourcebook of Science Center Statistics 2004.							

Financial Information

Museum	Operating Revenue	Operating Expenses	1c* Govt Contribs	10a* Sale of Goods	10b* Cost of Goods	17* Operating Expenses	25A+26A* Salaries	Form 990 year
DeWitt Stetten Museum of Medical Research								
Howard B. Owens Science Center								
Lathrop E. Smith Environmental Education Center								
Marian Koshland Science Museum								
Maryland Science Center	5,782,236	6,963,536	9,455,072	375,132	146,487	8,522,368	2,992,952	2003
National Geographic Museum at Explorers Hall	2,311,374	2,109,007						
National Museum of Health and Medicine			0	0	0	912,159	420,010	2004
* These numbers refer to line numbers from the IRS form 990								
"Operating Revenue" and "Operating Expenses" figures are from the ASTC Sourcebook of Science Center Statistics 2004								

Audience Information

Museum	Attendance	$ Admission			$ Membership	
		Adult	Senior	Child	Indiv	Family
DeWitt Stetten Museum of Medical Research	not applicable	0.00	0.00	0.00	0.00	0.00
Howard B. Owens Science Center	90,000 (AAM)	0.00	0.00	0.00	0.00	0.00
Lathrop E. Smith Environmental Education Center	18,900 (self estimate)	0.00	0.00	0.00	0.00	0.00
Marian Koshland Science Museum	30,000 (self estimated)	5.00	3.00	3.00	0.00	0.00
Maryland Science Center	341,000(ASTC)	14.50	13.50	10.00	50.00	100.00
National Geographic Museum at Explorers Hall	177,014(ASTC)	0.00	0.00	0.00	0.00	0.00
National Museum of Health and Medicine	75,000 (self estimated)	0.00	0.00	0.00	0.00	0.00

Programming

Museum	Adopt-an-Animal	Adult Programs	Affiliated Organizations	After-School Programs	Animal Feedings	Audio Tours	Behind-the-Scenes Tours	Birthday Parties	Changing Exhibitions	City walking & bus tours	Collections Accessible Online	Community Display Space	Concerts/Musical Events	Distance Learning	Elementary School Programs	Evening Hours	Facility Rental	Family Programs	Home-School Programs	Internships	Lecture Series	Outreach to Schools	Photo Contest	Pre- and Post-Visit Materials	Preschool Programs	Publications	Rental/Outreach Kits	School On-Site	School Tours	Scout/4H Programs	Seated Food Service	Senior Programs	Sleepovers/Camp-ins	Special Events	Teacher Training/Materials	Teen Programs	Topical Sales/Auctions	Travel/Trips	Traveling Exhibitions	Youth Day-Camps	Web Programming
DeWitt Stetten Museum of Medical Research			X																	X					X					X			X	X						X
Howard B. Owens Science Center			X	X	X					X					X	X						X						X	X				X	X	X					
Lathrop E. Smith Environmental Education Center			X	X	X					X					X	X						X						X	X		X		X		X	X				
Marian Koshland Science Museum		X	X	X					X									X		X	X			X					X					X	X	X					X
Maryland Science Center		X	X	X	X			X	X						X	X	X		X			X			X		X		X		X		X	X	X	X		X		
National Geographic Museum at Explorers Hall		X	X	X					X	X			X					X			X					X							X	X		X	X			
National Museum of Health and Medicine		X	X	X					X	X				X		X	X			X	X									X			X	X	X	X		X		X

Explanations

Adopt-an-Animal: The public can sponsor or contribute money towards the care of a specific live animal or a type of live animal

Adult Programs: Programs/classes specifically for adults college-age or later

Affiliated Organizations: Established partnerships with related clubs, affinity groups, etc (other than the museum's Friends group)

After-School Programs: Organized programs on weekday afternoons for school-age children

Animal Feedings: Visitors can observe and/or participate in feeding of live animals

Audio Tours: Recorded tours w/headphones available for free or to rent

Behind-the-Scenes Tours: Visitors can see how the facility works; can see collections storage or animal care etc.

Birthday Parties: Facility rental with special activities just for children's birthdays

Changing Exhibitions: Develop changing exhibitions with your collections/resources

City walking & bus tours: Guided tours for visitors of a related area outside of the facility

Collections Accessible Online: Database on website with the collections accessible to the public

Community Display Space: Gallery specifically for local artists and/or collectors

Concerts/Musical Events: An established program of concerts or musical performances: summer concert series, etc

Distance Learning: Educational programs conducted via web, email, or mail

Elementary School Programs: Organized programs (not just tours) specifically for elementary school-aged children

Evening Hours: Open one evening a week or more after 5pm

Facility Rental: The public can hold an event in the facility for a fee

Family Programs: Programs for parents and children together

Home-School Programs: Educational programs developed specifically for home-schoolers

Internships: Structured experiences for high-school/university/postgrad students for educational credit

Lecture Series: An organized program of presentations, by scholars/experts, related to the collections

Outreach to Schools: Education staff travels to schools to give presentations

Photo Contest: The public can enter a juried competition

Pre- and Post-Visit Materials: Materials for teachers to use in-class before and/or after a visit

Preschool Programs: Programs developed specifically for preschool children/toddlers

Publications: Exhibition catalogues, essay collections etc (not just gallery guides/annual reports/educational leaflets)

Rental/Outreach Kits: Schools can borrow a trunk/box/packaged program to give themselves at their schools

School On-Site: An actual school, public or private, physically on the grounds

School Tours: Tours of the facility focused on specific school curricula/standards of learning

Scout/4H Programs: Scouts can earn a badge

Seated Food Service: Café, cafeteria, or restaurant (not necessarily with wait staff but more than picnic tables and vending machines)

Senior Programs: Programs or events specifically for seniors/Elderhostel

Sleepovers/Camp-ins: Kids or families spend a night in/at the facility

Special Events: Annual festivals/major events/parties put on by the organization for the public

Teacher Training/Materials: Workshops, orientations, training, or printed materials specifically for educators

Teen Programs: Programs specifically for teenagers/high school age students

Topical Sales/Auctions: Fundraising sales that relate to the collections: exotic plants; wildlife art etc.

Travel/Trips: Organized groups go on a trip together with member(s) of the staff

Traveling Exhibitions: The organizations rents or borrows exhibitions from outside sources

Youth Day-Camps: Programs for school-age children that last a half-day or more for three or more days

Web Programming: Significant resources/activities/information on web site

Appendix H

Recent Additions to the Cultural-Educational Resources

Music Center at Strathmore

The Music Center at Strathmore is a $100 million venue built largely with public funds. The 2,000-seat auditorium in North Bethesda is also one in a growing list of sophisticated suburban performing arts centers in the Washington region and across the country. It will host 26 annual presentations of the Baltimore Symphony Orchestra, which will play there virtually every program that it performs at its home auditorium,

Strathmore also is slated to become the primary venue for a local philharmonic orchestra, a dance company, a youth orchestra, a music school and the Washington Performing Arts Society. It also will host concerts by the Choral Arts Society of Washington and other established performance groups in the region. Its nonprofit foundation, which will operate the hall, will offer programming for school groups.

As one of the few professional concert halls with a full music and dance education facility in the same building, the Music Center at Strathmore boasts two major rehearsal halls for orchestra and chorus, four classrooms, a 2,500-square foot dance studio with sprung floor, and nine practice rooms. Anchored by the Levine School of Music, CityDance Ensemble and Maryland Classic Youth Orchestras, the Education Center will be a hub of activity every day for children and adults.

Funding for the Music Center at Strathmore has been provided by both public and private sources. The State of Maryland and Montgomery County each provided half of the $98.6 million cost of construction. The Strathmore Hall Foundation, Inc. has raised $7.4 million of an additional $10 million for pre-opening costs and capital expenditures for the Music Center, and Strathmore and the Baltimore Symphony Orchestra are jointly raising $30 million for an operating endowment. Founding gifts of $1 million each for operations, endowment and artistic programming have been provided by Comcast; Discovery Communications, Inc.; The Gazette/The Washington Post/Post Newsweek Tech Media/Philip L. Graham Fund; Lockheed Martin; and the J. Willard and Alice S. Marriott Foundation.

Among the largest contributors were Lockheed Martin Corp., Constellation Energy Group, Choice Hotels, Marriott Foundation, and Chevy Chase Bank. Divisions of The Washington Post Co., including The Gazette, gave $1 million.

The Music Center at Strathmore is strategically located adjacent to the newly renamed Grosvenor-Strathmore Metro station and Rockville Pike.

Kensington

The Kensington Antique Tour features a row of antiques and specialty shops, 80 in all, which attract avid antiquers and people seeking a quality small-town experience in southern Montgomery County.

AFI Silver Theater and Cultural Center

The Art Deco Society of Washington launched a campaign in 1984 to preserve Silver Spring's historic theater and the surrounding buildings. Decades of work paid off in April 2003, when the theater re-opened in renovated style. The centerpiece of a $400 million revitalization project in downtown Silver Spring, it consumed $20 million in renovation costs. Today, the Silver Theatre is the newest member of the American Film Institute family and home to its East Coast operations.

Intense attention to detail produced a world-class restoration: The sleek signature lines and ocean liner feel of the theater have been carefully preserved. Original decor like carpet, colors and murals were researched and replicated, but also modernized with 21st century touches. Three separate theaters seat 75, 200 and 400 patrons. The Silver Theater aims to draw major premieres and documentary screenings.

Bethesda North Marriott Hotel & Conference Center

Montgomery County is now home to one of the largest conference centers in the Washington, DC metropolitan area. Construction of the 100,000 square foot center coupled with a new, full-service 225 room Marriott Hotel was completed in fall 2004.

The conference center houses a 23,000 square foot ballroom as well as 13,000 square feet of high quality meeting rooms, classrooms, boardrooms and a 130-seat amphitheater, in addition to 20,000 square feet of public open space which can be used for exhibit, reception and other pre-function purposes

Nederlander

Nederlander Worldwide Entertainment plans to restore the former Bethesda Theater to its 1930s glory and open a 700-seat performance theater for off-Broadway shows. The theater will be the touring headquarters outside New York for the Nederlander company's off-Broadway circuit, which features shows with smaller casts, no orchestra and less elaborate sets than those found on Broadway.

In 2001, the Bozzuto Group of Greenbelt and Smith Payes of Bethesda broke ground on a $62.5 million project that incorporated the theater, which is listed on the National Registry of Historic Places, in a project with an adjacent apartment building, The Whitney at Bethesda Theatre, and a 350-space public parking garage. People now refer to the theater simply as Bethesda Theatre.

Appendix I

Operational Partnership Comparables

Science Center System in Ohio

In the late 1980s and early 1990s, the largest science center in Ohio, the Center of Science and Industry (COSI), Columbus, initiated a program of spreading hands-on science centers throughout the state. It established a holding company, COSI-Ohio, which was to have been home to COSI-Columbus and those initially planned for Cincinnati, Cleveland and Toledo. This board was controlled 5-4 by members of the COSI-Columbus board.

While the plan for the statewide system was in its early development stage, local groups in Cleveland and Cincinnati pre-empted the concept. The Great Lakes Science center was started in Cleveland, opening in 1988. The venerable Cincinnati Museum of Natural History relocated to the renovated Union Terminal in 1990, and subsequently expanded its offerings, becoming the Museum of Natural History and Science in 1995. The Cinergy Children's Museum was added to the complex in 1997. Thus only Toledo remained as a partner city.

COSI Columbus approached the city of Toledo in an opportunistic manner. The Portside Festival Marketplace on the Maumee River in downtown Toledo failed in 1990. The bank that held the assets of the failed center was owned by a Trustee of COSI Columbus who was very helpful in organizing the Toledo science museum and arranging for it to occupy Portside. The two facilities approached the State of Ohio for public funding for COSI Toledo and a new facility for COSI Columbus. The capital grant to COSI included $10 million for Toledo and $50 million for Columbus. Roy Shafer, director of COSI-Columbus during this activity, credited the two-city approach with providing an important advantage when the state government was approached.

Initially Toledo shared board appointments with Columbus. By 2003 only COSI-Columbus President & CEO served on the Toledo Board and no Toledo members were on the Columbus Board. The two organizations are incorporated separately and report their IRS 990s separately. Each board is fully responsible for its institution. The holding company has effectively dissolved, and COSI-Columbus has formally left it.

The original plan was for the two facilities to create an economy of scale by sharing back-of-house support facilities – accounting, human resources, and exhibition design and development. This did not occur to the extent originally envisioned. While COSI-Columbus staff designed and built COSI-Toledo's initial exhibits (under COSI-Toledo supervision), this no longer occurs and COSI-Columbus has sold much of its exhibition design and fabrication operation to a former employee. Currently, the Toledo facility contracts payroll and benefits to Columbus. These functions will default to Toledo when it, as planned, leaves COSI Ohio.

Former Director of COSI-Toledo, William Booth, points out that, apart from fees for services, no funds flowed between the two institutions and, once the initial capital had been obtained, the collaboration resulted in no further funding or operational benefits for either institution. Very soon after it opened, Toledo functioned as an autonomous organization with whatever benefits the COSI "brand" provided to it.

Nonetheless, the two museums currently have a common internet portal and take advantage of the common name in external funding solicitations. Former Director of COSI-Toledo Booth will be pleased to meet with the Rockville science center to share in depth his views on how this collaboration started and evolved into its current dysfunctional state.

Science Center Network in Virginia

The Science Museum of Virginia in Richmond is the center of an expanding network of science centers, some state-operated and some private, intended to have a science museum within one hour of all residents of the Commonwealth. This process seems

to have established the essential balance between local control and decision-making, efficiencies of scale, political influence, and obvious benefits for all.

The Science Museum of Virginia opened as a state agency in the historic Broad Street Station in 1976. Its board encouraged the establishment of regional science museums, the first two of which were in Newport News (Virginia Living Museum) and Roanoke (Science Museum of Western Virginia).In 1990, the Virginia Aeronautical Historical Society donated its facility collection to the SMV which then began operation of its first satellite, the Virginia Aviation Museum. Plans are now in place for this museum to move into Richmond near the SMV's main facility.

In the 1990's it was decided to develop a statewide network of general science museums, strategically placed to complement the museums already in place – those mentioned above plus the Virginia Museum of Natural History in Martinsville (a unit of the Virginia Secretary of Natural Resources).

The Danville Science Center opened in 1995. It is a small facility with four FT and five PT staff and an annual estimated attendance of 20,000. The Danville MSA population is 110,000. The museum occupies the historic former Southern Railway Passenger Station and the nearby renovated administrative building. Location of the museum there provided the city with an anchor tenant for downtown development, and the city pursued an Intermodal Surface Transportation Efficiency Act (ISTEA) appropriation for the rehabilitation of the building. The local community supports it actively (e.g., operating funding from service clubs and local businesses) in addition to its state support.

One year later the Shenandoah Valley Discovery Museum opened in Winchester. It also is small (6,500 square feet, six FT and 2 PT employees, and attendance of about 35,000). Winchester city and Frederick County have a total population of about 90,000. The museum is now located in the Downtown Walking Mall. A new, environmentally-sophisticated building is currently under construction in Jim Barrett Park. It will include substantial outdoor exhibition and program space.

Two other satellite museums are being developed, in Bristol and in Woodbridge. The Mountain Empire Science Center in Bristol is not yet open, though a location has been selected. This community is part of the Johnson City MSA, with a population of 480,000. (There already is a science center in Johnson City – the Regional Hands-On! Museum which attracts 66,000 visitors.)

By far the largest of the satellites is the Belmont Bay Science Center in Woodbridge. It is projected to serve the northern Virginia suburbs and is only 23 miles from downtown Washington. The facility is projected to be 175,000 square feet and serve an on-site audience of 550,000 to 750,000. The project is well along. A site has been selected in the upscale Belmont Town Center, adjacent to the 680-acre Occoquan Bay National Wildlife Refuge. The Belmont Bay project was initiated by the Virginia Secretary of Education during the Wilder administration, and is being spearheaded by Prince William County. Preliminary architectural sketches have been prepared, outreach programming is in place, partnerships have been established with George Mason University and the National Park Service, and the SMV currently is reviewing proposals from experience design firms. The estimated project budget is $120 million, including $15 million for endowment. The museum is projected to open in 2008 with a staff of 86 FT and 38 PT employees and an operating budget of about $8.5 million.

This is a centralized network, with the budget and major decisions residing with the SMV in Richmond. SMV Director Dr. Walter M. Witschey's office represents the entire network to the Virginia legislature. Each museum develops it own operating budget. They then are combined into a single operating request. The capital projects of each museum are presented individually, in a priority order determined in Richmond. The SMV provides support services for the network museums – general management, marketing, finance, human resources, IT, and exhibit fabrication. Individual sites are responsible for daily operations, selection of visiting exhibitions. The members of the boards of the local foundations are nominated locally and then approved by the SMV Board of Trustees. Traveling exhibitions built by the SMV are circulated through the network, but individual museums can bring in others as they choose. The outreach programs of the SMV are available state-wide.

The Virginia network is developing quickly and apparently quite smoothly under the direction of SMV Director Witschey. He offers to confer with the Rockville planning team if it so desires.

Appendix J

Maryland Science Center Fact Sheet

Facts about The Maryland Science Center

WHAT YOU SEE HERE...

100,000 square feet of permanent exhibit space — 6,600 square feet of temporary exhibit space

11 permanent exhibits:

Fossils	Follow the Blue Crab	Outerspace Place
BodyLink	Human Body	Spacelink
The World of Cells	Dinosaur Mysteries	TerraLink
Newton's Alley		

Davis Planetarium: 60 special effects projectors and a Minolta MS-15 Star Projector capable of showing 8,500 stars. Features fascinating original presentations.

Crosby Ramsey Observatory: Computer controlled 25 inch telescope for solar, lunar and planetary observations

IMAX theater: A five story screen featuring 38 speakers and 11,000 watts of sound, in classic IMAX and IMAX 3D

The Kids' Room: A bright, interactive space where young children explore their world through age-appropriate, hands on activities. In the resource room, parents and care givers can access resources which help them to encourage learning in their children

WHAT YOU CAN LEARN HERE...

Classroom experiences offered:

Chemistry	Biology	Geology	Physics
Paleontology	Astronomy	Micro-biology	Anatomy
Astrophysics	Forensics	Environmental Science	Biochemistry
Zoology	Electricity	Physiology	Earth Science
Seismology	Robotics	Aeronautics	Cryogenics
Space Science	Geography	Ecology	Solar Science

Above classes use scientific techniques such as:

Video microscopy	Electrophoresis	Titration	Optics
Chemical Analysis	Chromatography	Spectroscopy	DNA extraction

IN THE COMMUNITY...

The Traveling Science Program: Offers three types of programs: Assembly, Classroom, Starlab

Topics covered by Traveling Science Programs:

Geology	Scientific Method	Cryogenics	Aerospace
Physics	Chemistry	Electricity	Biology
Earth Science	Social Science	Forensics	Astronomy