

# **Recommendations for Wonder Universe**

**(Formerly known as  
Children's Museum of Blacksburg)**

**Prepared by  
The Office of Economic Development, Virginia Tech**

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# Executive Summary

The former Children's Museum of Blacksburg (CMB) formally began operations in the spring of 2014 with a mission to inspire children to become creative thinkers and problem-solvers. CMB catered to newborns and children up to the age of eight. The organization served as the New River Valley's only children's museum, attracting over 20,000 guests annually. In 2018, museum administration announced that CMB would be moving to a larger space in Christiansburg's New River Valley Mall. The new location marks a 6,000 sq. ft. increase in floorspace and will be accompanied by new exhibits, expanded offerings, and a new name- Wonder Universe.

The Virginia Tech Office of Economic Development (OED) was contacted by the former Executive Director of the Children's Museum, Dr. Sarah Hanks, to develop a better understanding of the value the museum brought to the families and the greater region and investigate strategies to expand the value in its new location. OED analyzed literature on children's museums and early childhood development and the operations of nationally renowned children's museums to better understand children's museums at large and inventory best practices. OED then used these findings to develop a survey aimed at gauging user satisfaction with the previous location and user's preferences and aspirations for the new location. The following report is divided into two sections that largely resemble OED's approach to this process: 1) understanding the value and 2) expanding the value. Both sections utilize best practices taken from relevant literature, case studies, and operational, financial, survey, and census data to first understand the museum's current footprint in the New River Valley, and provide actionable recommendations aimed at expansion.

## Understanding the Value

Children's museums serve as both places of recreation and early childhood development. The declining national population of children under the age of ten, however, has put such organizations in a precarious situation. Children's museums must now adapt and expand their services to attract new visitors and members and monitor visitor satisfaction to retain their current members and guests in order to remain successful. Additionally, museums must invest in understanding market demand for early childhood development services to make amendments to existing membership schemes, events, and marketing strategies. Furthermore, cases studies highlighted the increasing role of partnerships with federal agencies, higher education, schools, and businesses as important to the continued success of these organizations.

Survey results were favorable for CMB when considering overall satisfaction with exhibits and programs. A healthy number of current members indicated that they were planning to renew their current membership. Preliminary attempts to assess the "footprint" of the museum, however, were less favorable. Survey results, operational and financial information, and census data suggest that the former Children's Museum of Blacksburg did not substantially penetrate any market or demographic in the region. While museum members demonstrated commonalities in income, family size, and employment, CMB's customer demographic is not fully representative of any socioeconomic group within New River Valley. Survey data also uncovered

a missed market for membership among the region's large number of middle to lower income families.

### **Expanding the Value**

The museum's decision to move to a new, larger location will allow for more exhibits and programming space. This increase in space, however, will be accompanied by rising operational costs. Museum administration hopes to more than double the previous year's attendance of 20,064 to 45,000 in Wonder Universe's first year of operations. Additionally, administration forecasts a required revenue increase of approximately 200% to keep pace with rising costs. Survey respondents identified Christiansburg as the most popular shopping, dining, and entertainment destination in the region, which is auspicious for the museum's ambitious goals. Additionally, the vast majority of visitors and members indicated high satisfaction with CMB, noting that the museum provided a safe indoor place for children and parents to socialize and meaningful informal learning and developmental opportunities. High satisfaction rates and prime location, however, will not be enough to ensure the success of Wonder Universe. The museum must be more intentional in how it capitalizes on the successes of the previous location, develops new exhibits and programs, markets its services to regional families, and partners with federal, state, and local entities to ensure the delivery of Wonder Universe's expanded mission and goals. To accomplish this, OED has developed the following recommendations, each of which are expanded upon throughout the following report:

#### **1. Expanding the footprint**

- a. Identify potential members in the region in terms of family type/size, demographics and socioeconomic indicators, and culture.
- b. Make the museum more economically accessible to the region by introducing tiered memberships/discounts, etc.

#### **2. Developing innovative and collaborative exhibits and programs**

- a. Provide "makerspaces" as places for innovation, creativity and hands-on experience for family members.
- b. Engage visitors in design process, negotiate and communicate the meaning and values of a potential exhibit among museum staff and visitors.
- c. Increasing adults' involvement in a play process by explicitly associating unstructured play with learning, teaching them how to effectively facilitate play and designing exhibits with enough information for parents to scaffold their child's experience.

#### **3. Diversifying partnerships**

- a. Define mission, goals, and issues and formulate strategies/allocate staff time to grant research and proposal writing.
- b. Engage regional higher education for collaboration, student enrichment opportunities, and talent.
- c. Leverage membership to attract corporate and local business support. Clearly define the museum's reach and expectations from private sector partnerships. Market sponsorship/partnership opportunities as mutually beneficial.

# Introduction

The Virginia Tech Office of Economic Development (OED) was contacted by the former Children's Museum of Blacksburg to generate a better understanding of the value the museum brought to families in the New River Valley and the region itself. The Children's Museum of Blacksburg- now known as Wonder Universe- is in the process of moving from its old location in the First and Main shopping center in Blacksburg to a larger space in the New River Valley Mall. The museum formally began operations in the spring of 2014 with a mission to inspire children to become creative thinkers and problem-solvers. The museum was designed to foster creative and playful informal learning opportunities for newborns, infants, and children up to the age of eight through exhibits and programs intended to catalyze early childhood development.

The Children's Museum of Blacksburg operated for approximately four years in a 9,400 sq. ft. retail space located in Blacksburg Shopping center. The museum outgrew its original space over the course of four years, frequently meeting or exceeding capacity during busy periods. Additionally, the museum was nearing the end of its in-kind lease agreement with the property owner and began searching for a new location. Museum Administration announced that the museum would be moving to Christiansburg in 2018 with a goal of being operational in this new space by the end of 2019.

The museum hopes to expand the regional footprint and value of the museum alongside moving into a larger space. OED was contracted to support this effort by measuring the value of the museum in its former location and investigating opportunities to expand that value in its new location. OED first collected and analyzed literature and data pertinent to children's museums and early childhood development. This process informed OED staff regarding the operational aspects of children's museums and helped them create an inventory of best practices. Drawing from the data from the literature and best practices, OED developed an online survey to gauge members' satisfaction with CMB's services and their perception of the Museum's value to themselves and to the broader region. OED combined findings and insights gained from the literature review and comparative case analysis and the surveying portion of this process to provide recommendations for expanding the value the museum brings to families and the region and demonstrate Wonder Universe's footprint in the New River Valley.

This report begins with a brief overview of OED's methodology in this process. Following this, the report is divided into two sections that represent OED's approach to this project: understanding the value and expanding the value. The "understanding the value" section provides information on the valuable aspects of nationally and regionally successful children's museums, specifically membership, exhibits and programming, and partnerships. This section also provides survey and operational data aimed at gauging CMB's performance based on those three areas. The "expanding the value" section of this report builds on findings from the previous section. Here, OED outlines best practices and recommendations for the museum as it moves into its new space and seeks to better serve the region.

# Methodology

OED adopted a two-phase approach to better understand the value Wonder Universe brings to families and the region. Phase 1 included an expansive literature review aimed at uncovering best practices in museum operations. OED compiled and analyzed literature relevant to museums, children's museums, and early childhood development to develop an understanding of the environment, operations, and the fundamentals of museum operations and informal learning. OED also reviewed nationally successful children's museums to support the best practices found in the literature (please see Appendix A). OED inventoried innovative ideas regarding membership, exhibits and programs, and partnership that were most applicable to Wonder Universe during this process.

Phase 2 included developing a survey to gauge museum user's satisfaction with the former Children's Museum of Blacksburg in light of findings from phase one. The survey included 25 questions related to membership, satisfaction, value, and the user's likeliness to renew their membership and recommend the museum. Additionally, the survey provided respondents with an opportunity to give recommendations for future exhibits and programs at the new location. The survey was active for eight days and collected 127 valid responses, out of which 48 were member and 79 were non-member responses. While OED's survey does not fully represent the nonmember and member users of the museum, findings were used to create two broad demographic groups used to assess what markets had and had not been accessed by CMB (please see Appendix B for full survey results).

## Understanding the value

Understanding the value that the former Children's Museum of Blacksburg brought to families and the greater New River Valley is essential to providing recommendations to expand this value. This section will present key findings from OED's literature review, national and comparable case analysis, and survey that relate to the value of children's museums in general, museum operations, and satisfaction with the museum in its previous location. More specifically, this section will provide important information on membership, exhibits and programming, and partnerships.

## Membership & Current Market

### National Trends: Membership

Marketing children's museums can be difficult in that the general public is not familiar with these organizations. While the first children's museums appeared in the United States at the turn of the 20th century, they are largely an advent of the 21st century.<sup>1</sup> For instance, there were only 38 Children's Museums in the United States in 1975. This number grew to 118 by 1990 and 268

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<sup>1</sup> Time. (1939). "Laboratories of Patriotism." Retrieved from:  
<http://content.time.com/time/magazine/article/0,9171,760639,00.html>

in 2007.<sup>2</sup> While these museums are more commonplace today, many current parents and grandparents were not exposed to them as children and in many cases are unaware of nearby children's museums and the benefits associated with visiting them.<sup>3</sup> There is also a social component associated with children's museum awareness. According to a report prepared by the American Alliance of Museums (AAM), educated and more cosmopolitan parents seek out experiences to develop their child's social, cognitive and emotional skills at an early age, therefore engaging families from other social strata is a common challenge for most children museums.<sup>4</sup> Finally, there are fewer children in the United States when compared to past decades. According to U.S. Census Bureau (shown in Figure 1) the percentage of the U.S. population represented by children (people younger than age 9) had decreased steadily in the past 40 years, dropping from 18.3% percent of the overall population in 1970 to roughly 12.6% percent of the population in 2017.<sup>5</sup>

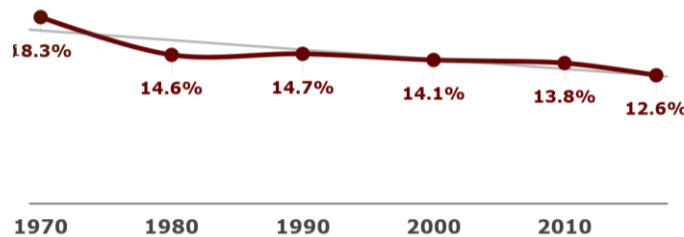


Figure 1: Percentage of Children under 9 years old, United States, 1970-2017.<sup>6</sup>

Therefore, children's museums must be innovative and adaptive marketing their services to prospective members and guests. Additionally, children's museums must allocate resources to retaining current members. According to the literature, membership renewal is an inseparable component of financial sustainability in children's museums. Renewal intention is significantly influenced by satisfaction with the membership program, frequency of visits, length of membership (longtime members are more likely to renew), member's age (as age increases, there is an improvement in membership retention rate), and average household income.<sup>7</sup>

<sup>2</sup> Munley, Mary Ellen. (2012). Early Learning in Museums: a review of literature. Smithsonian Institution. Retrieved from:

<https://www.si.edu/Content/SEEC/docs/mem%20literature%20review%20early%20learning%20in%20museums%20final%204%2012%202012.pdf>

<sup>3</sup> Mayfield, M. I. (2005). Children's museums: Purposes, practices and play? *Early Child Development and Care*, 175(2), 179–192. <https://doi.org/10.1080/0300443042000230348>

<sup>4</sup> O'Rork, S. D. (2018). *Museum Assessment Program Community Engagement Assessment Final Report* (pp. 1–34) [Museum Assessment Program (MAP)]. American Alliance of Museums.

<sup>5</sup> U.S. Census Bureau.

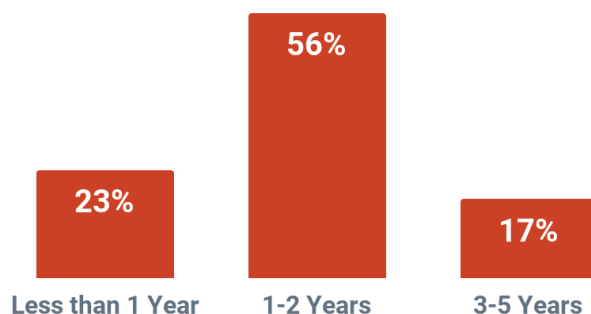
<sup>6</sup> Ibid

<sup>7</sup> An, L. B., & Butler, F. C. (2017). An Analysis of Factors Influencing Membership Retention at a Children's Museum. *Journal of Nonprofit & Public Sector Marketing*, 29(3), 254–273. Retrieved from:

<https://doi.org/10.1080/10495142.2017.1326350>

## Membership Characteristics

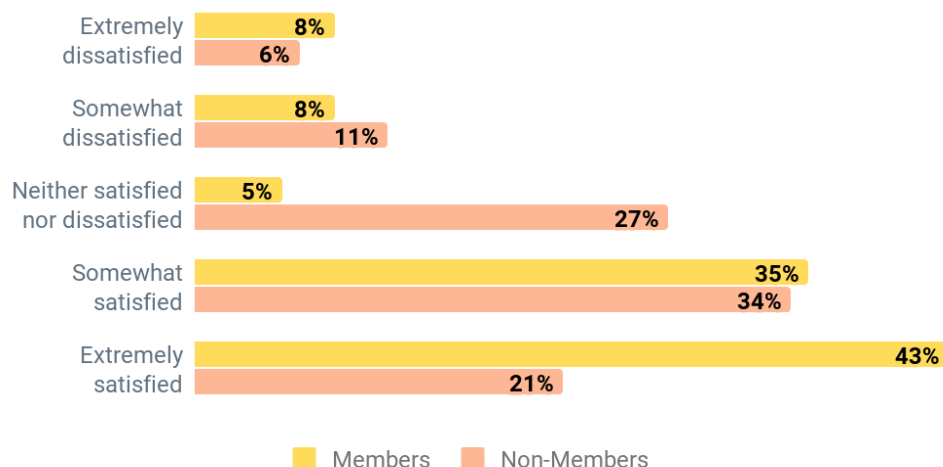
Survey results uncovered that over half of member respondents had memberships for 1-2 years (shown in Figure 2). Only 17% of member respondents indicated having a membership for between 3-5 years, although this could be due to the museum's previous target audience of children less than the age of five and the overall nascency of the organization. Targeting a larger audience, such as children aged 0-10, in the new location could positively influence the duration of memberships. Survey results also indicated that the majority of the member respondents (78%) planned to renew their membership. Few, if any, of the 22% of respondents that indicated that they did not plan to renew their membership mentioned dissatisfaction as a motive. Rather, many of these families had children that had outgrown the museum's offerings or were moving out of the region.



*Figure 2: Membership duration*

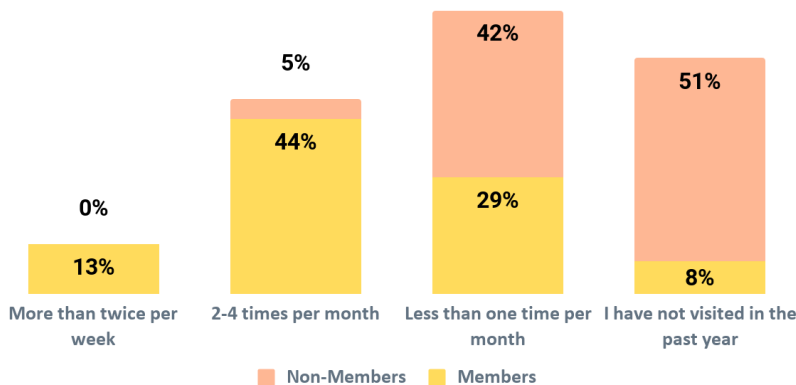
Successful case studies suggest that improving service quality, opening new exhibits, and having more member events can increase customers' satisfaction and frequency of visits (and hence their membership renewal). Member satisfaction is not only important to individual member renewal, but also important for the recruitment of new members, as satisfied customers are more likely recommend the museum to others. Satisfied members are also frequent visitors, which is also linked to increased renewal. Satisfaction among members also increases monetary donations, volunteer support, and word of mouth to inspire other members to do the same, all of which were deemed as vital to the success of national and peer museums. Survey Respondents indicated a high level of satisfaction with CMB. Approximately 78% of members and 55% nonmembers (shown in Figure 3) indicated that they were either somewhat satisfied or extremely satisfied with the services offered at the previous location.





*Figure 3: Survey Respondents Overall Satisfaction*

Survey results uncovered that nonmembers were more far likely to feel ambivalent about their experience at CMB. Literature suggests satisfaction is often a product of visit frequency, which correlates with a lower visit frequency for nonmembers compared to members. For instance, 57% of member respondents identified as regular visitors, coming to the museum at least every other week. Conversely, 93% of nonmember respondents indicated less than one visit per month, with 51% having not visited the museum in over a year (shown in Figure 4).



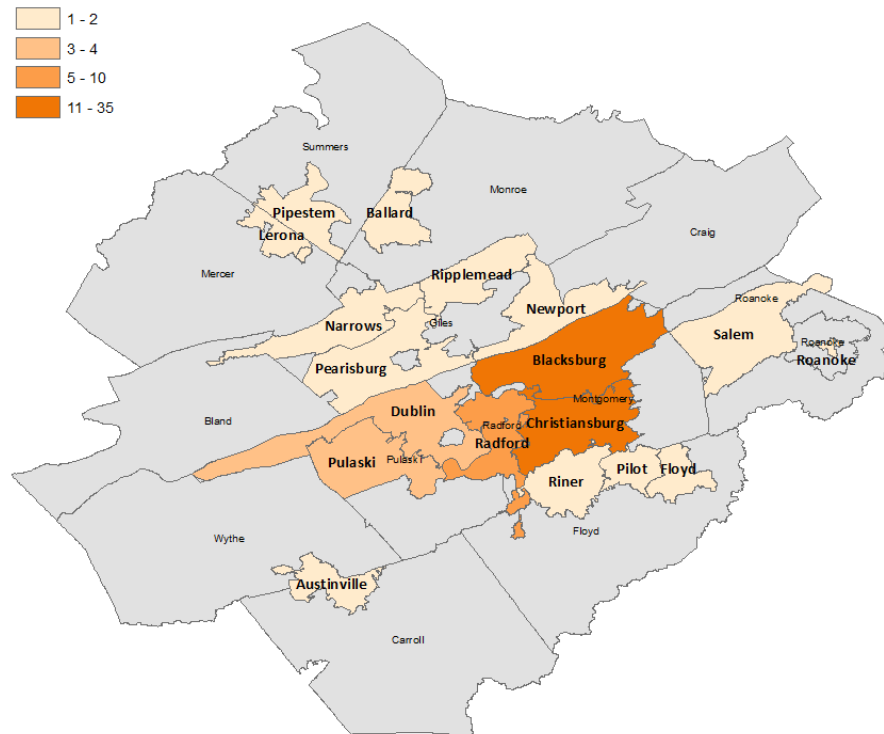
*Figure 4: Visit Frequency by Member and Nonmember Users*

Figure 5 illustrates the most common words and phrases entered when respondents were prompted to express the value CMB brought to their families. Common words used when prompted to describe the value the museum brings to families were: Learn, Fun, Love, Indoor, Safe, Explore, and Autism. One respondent noted that the museum was “... a safe, indoor, welcoming place for children with special needs” while another mentioned, “It’s a place that my 5 year old with autism loves to go and can be himself. He absolutely loved the train station and tables.”



OED also asked respondents to elaborate on the value they believed the museum brought to the New River Valley. Several respondents considered the museum to be a safe and affordable indoor play space, also noting that the museum provided learning opportunities for children and parents alike. Another respondent appreciated the interactive and hands-on experiences the museum offered visitors, stating, *“It’s important to allow my toddler to be creative, socialize, and experience play in an educating environment with her surrounding community.”* Others considered the museum a safe and neutral space for children and parents to socialize. Finally, a number of museum users praised CMB for providing exposure and interaction to people from diverse cultural backgrounds.

The former Children’s Museum of Blacksburg (CMB) attracted 20,064 visitors in 2018 and sold approximately 375 memberships. It is important to note that repeat member visits accounted for approximately 70% of all museum visits in 2018. Therefore, approximately 6,000 visits can be attributed to first-time guests or repeated visits from non-member families. OED asked museum users where they lived to get a sense of the organization’s footprint in the region. According to survey results, most respondents live in the New River Valley,<sup>8</sup> with a majority of respondents living in Blacksburg, Christiansburg, and Radford (as shown in Figure 6).

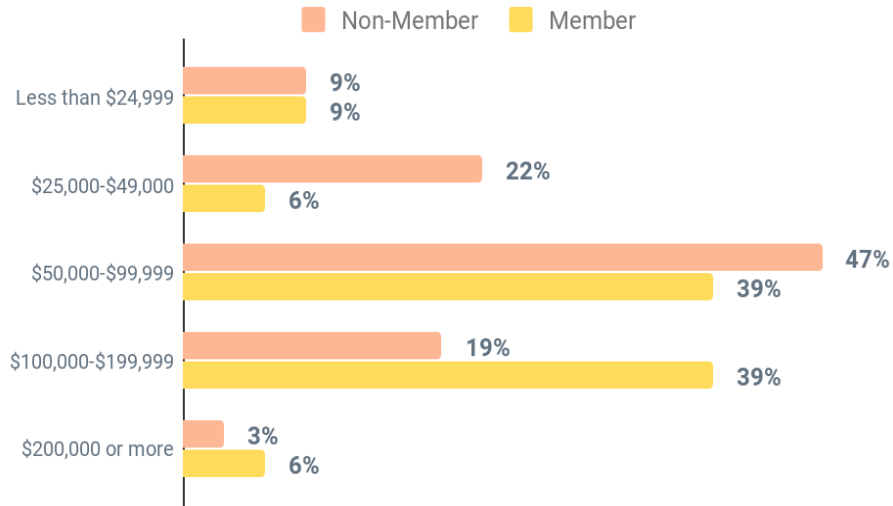


*Figure 6: Museum users by provided Zip Code.*

While OED's survey captured only a fraction of museum members and visitors, evidence overwhelmingly suggests that the New River Valley was CMB's primary market and will serve as the primary market for Wonder Universe. According to the most recent census data, there are approximately 3,600 families and 3,400 households in the New River Valley with children aged under six.<sup>9</sup> Additionally, there are approximately 2,700 families and 2,700 households with a child aged under six and a child aged between 6 and 17 years of age. Married couple households account for the majority of households in the region, although Montgomery County and the City of Radford has a high number of non-family households. Average family size was larger at 2.9 people overall, with married couple families also at 2.9 and single parent families lower at 2.7. Median family income for this region (weighted) was \$66,902 for the same year.

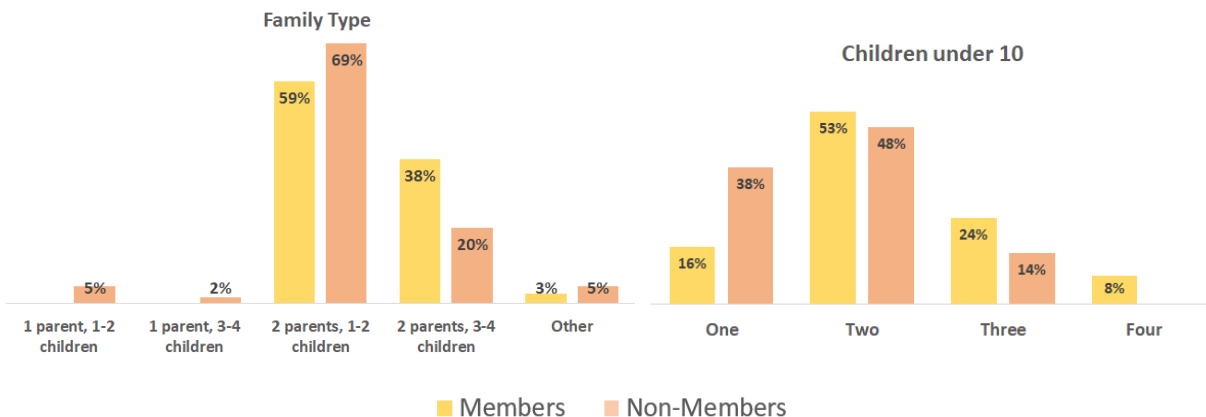
OED asked survey respondents a number of demographic questions to analyze how museum users compared to the overall region. Specifically, OED asked respondents to indicate their income and the characteristics of their family. When considering income, the vast majority (84%) of member respondents indicated a family income of above \$50,000 annually. The remaining 16% of member families made less than \$50,000 annually, with 6% making between \$25-49,999 and 9% making less than \$24,999 annually. Nonmember families were more likely to make between \$50-99,999 annually compared to member families, however, they are less represented in higher income brackets. Nonmember families were also considerably more likely to earn less than \$50,000 annually.

<sup>9</sup> U.S. Census Bureau.



*Figure 7: Survey Respondents Annual Family Income*

Member families are more likely to have more than one child compared to nonmember households. Additionally, member families are slightly more likely to be two-parent households, according to survey results. Member families are also more likely to have more young children when compared to nonmember families. For instance, only 16% of member families had one child under the age of ten, compared to 38% of nonmember families (Shown in Figure 8). Additionally, over a third of member family respondents indicated have three or more children under the age of ten.






*Figure 8: Family Characteristics of Survey Respondents*

Overall, member families are more likely to be affluent. Survey responses indicate that member families are better represented in higher income brackets compared to nonmember families. Additionally, member families are typically larger and have younger children. Nonmember families are more likely to be smaller and have less children under the age of 10. Additionally, a fewer number of nonmember families make above \$100,000 while a higher number of

nonmember families earn less than \$50,000 annually. Single parents are also more likely to be nonmembers, according to survey data.

When compared to the region, member families tend to be more affluent while nonmember families were more likely to be less affluent. The region’s median family income was \$66,902 (weighted) for 2017, with 61.4% of families making more than \$50,000 annually and 38.6% making less than \$50,000 annually (shown in Figure 9). Similar to nonmember families, the average regional family is more likely to have one child for married couple families and one to two children for single parent families.

| Member Families   | Nonmember Families   | Regional Families   |
|---|--|---|
|    |   |   |
| <ul style="list-style-type: none"> <li>• 84% earn above \$50,000</li> <li>• 16% earn less than \$49,999</li> <li>• More likely to have larger families</li> </ul> | <ul style="list-style-type: none"> <li>• 59% earn above \$50,000</li> <li>• 41% earn less than \$49,999</li> <li>• More likely to have two or less children</li> </ul> | <ul style="list-style-type: none"> <li>• 61% earn above \$50,000</li> <li>• 39% earn less than \$49,999</li> <li>• More likely to have one child</li> </ul> |

*Figure 9: Member, Nonmember, and Regional Families by Income and Family Size*

## Exhibits and Programs

### Value of Exhibits and Programs

Studies have revealed that early childhood education within children’s museums exceeds simple acquisition of facts and, instead, extends into procedural or cause/effect learning.<sup>10</sup> According to studies, guided (either by parent or museum educator) hands-on activities are the leading effective activities for facilitating children’s learning in most children’s museums and a representation of child–environment–adults/peers interactivity. Freedman conducted a playful experiments strategy (child–environment and child–environment–adults/peers interactivity) which presented an example of how hands-on activities help to facilitate children’s learning through child–adults/peer and child–environment interaction.<sup>11</sup> Wickens also described the use

<sup>10</sup> Puchner, L., Rapoport, R., & Gaskins, S. (2001). Learning in children’s museums: Is it really happening? Curator: The Museum Journal, 44(3), 237–259. doi:10.1111/j.2151-6952.2001.tb01164.x.

<sup>11</sup> Freedman, M. R. (2010). A “healthy pizza kitchen” nutrition education program at a children’s health museum. Journal of Nutrition Education and Behavior, 42(5), 353–354. doi:10.1016/j.jneb.2010.01.012.

of a storytelling activity for preschool children as part of a three-mode structure (story/tour/activity). This method combines narratives, hands-on activities, free play, free exploration and guided multisensory experience.<sup>12</sup>

Victor Regnier conducted a study of seven children's museums to assess children's museum exhibits and locations, paying specific attention to the creative ideas they employed in developing various activities and displays.<sup>13</sup> Through a series of interviews he found that, *"...successful exhibits are generally simple to understand (but enjoyable to play with) and require little formal instruction."* Additionally, studies show that exhibits that provide the opportunity for children to explore objects by climbing on or through them are also considered successful. Multi-Sensory Exhibits -or exhibits designed to stimulate several of the five senses, sometimes simultaneously- are also identified as being conducive to early childhood development.

Other case studies suggest exhibits that promote activity, health, wellness, and ecoliteracy are popular choices. The "Kid Power" exhibit in Boston, MA, or the "Smart Moves with Food and Fitness" exhibit in Tacoma, WA, encourage playful interaction between children and parents while providing important information related to exercise and nutrition.<sup>1415</sup> Role playing exhibits are also considered popular with children. These exhibits typically allow children to assume pretend roles, such as firefighters, police officers, farmers, shopkeepers, etc. These exhibits are often engaging for children while also offering meaningful opportunities to learn about jobs and various other community roles.

Unpopular exhibits tend to provide too much information without being interactive; rely on words and reading comprehension; are simply too complex; are not relatable to a child's experience; and require some sort of training. Additionally, exhibits that are too time consuming are oftentimes unpopular. A study at the Children's Museum in Boston found that children spent 5–10 minutes at an exhibit or activity in a children's museum compared with 10–30 seconds for adults at a traditional museum exhibit. It was also found that children spend considerably more time at interactive exhibits.<sup>16</sup> Exhibits that are too interactive might be overwhelming to children and parents. Additionally, lengthy exhibits might diminish a child's chance to experience other museum offerings.

The tenure of museum exhibits is yet another consideration for museums. Permanent exhibits may be important attractions for marketing purposes, however, they typically require ongoing maintenance and periodic refurbishment. Temporary exhibits are typically less costly and may be

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<sup>12</sup> Wickens, K. A. (2012). Museums and community—The benefits of working together. *Journal of Museum Education*, 37(1), 91–100.

<sup>13</sup> Regnier, V. (1987). The Children's Museum: Exhibit and Location Issues. *Children's Environments Quarterly*, 4(1), 55–59.

<sup>14</sup> Association of Children's Museum (2010). Healthy Kids Healthy Museums. Good to Grow. Retrieved from: <http://childrensmuseums.org/images/Library/HealthyKids-HealthyMuseums.pdf>

<sup>15</sup> Association of Children's Museum (2008). Kids dig dirt-Green Paper. Good to Grow. Retrieved from: [http://childrensmuseums.org/images/Library/acm\\_kidsdigdirt\\_greenpaper.pdf](http://childrensmuseums.org/images/Library/acm_kidsdigdirt_greenpaper.pdf)

<sup>16</sup> Mayfield, M. I. (2005). Children's museums: purposes, practices and play? *Early Child Development and Care*, 175(2), 179–192. <https://doi.org/10.1080/0300443042000230348>

developed by the museum's staff or rented from other children's museums. These exhibits can be important for enticing repeat visitors (which could lead to new membership) and retaining existing members through providing new experiences.

Survey findings suggest that exhibits were more popular than the programs at CMB. The most popular exhibits are Train Station, Big Blue Blocks, and Market, according to survey results. Some respondents indicated dissatisfaction with the hair salon, geography, and theater exhibits. Programs offered at CMB were more restrictive in terms of audience compared to exhibits. OED concluded that many survey respondents were unaware of these programs, largely due to the times they are held and the ages they cater to. Nevertheless, *Story Time with Joelle* and *All Day Art* were identified as the most popular programs offered at CMB. The STEM Sunday program was noted as the least satisfying program among survey respondents.

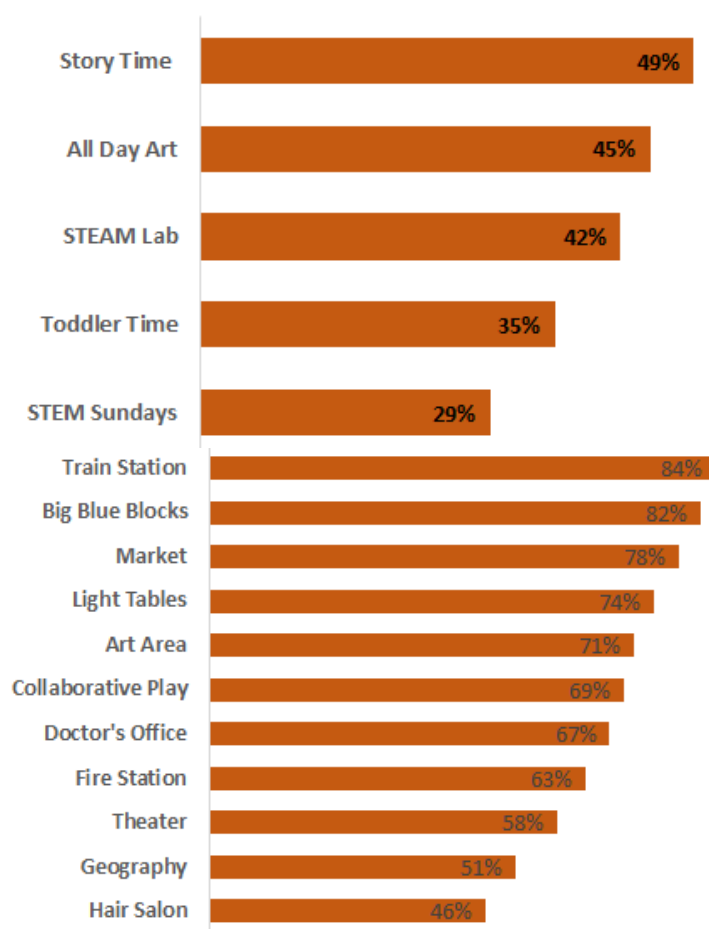


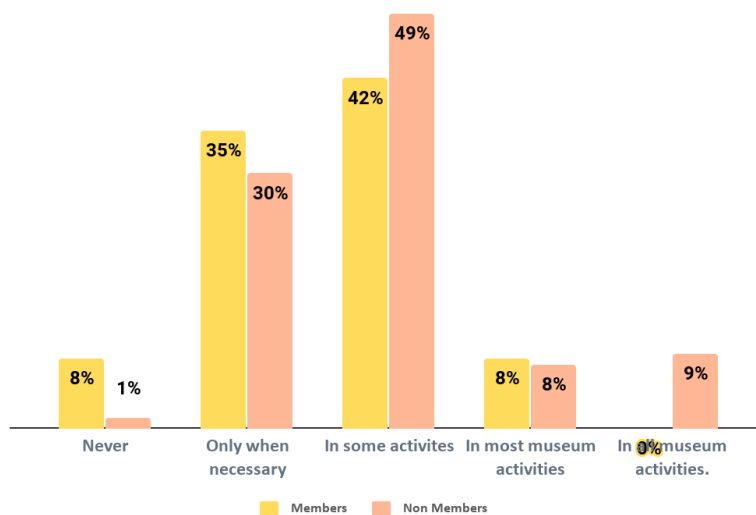
Figure 10: Popular exhibits (top) and Programs (bottom)

## Parental Role

An increasing amount of literature notes the compounding positive effects of early childhood development/informal learning when parents act as facilitators. Scaffolding, or supporting a child's learning experience while still allowing for independence, is highlighted in a number of studies as an essential strategy for maximizing children's learning during family or school visits to

museums. Parents can play an important role in shaping and supporting children’s scientific thinking in everyday activities. For instance, early childhood development researchers observed that when children were with their parents at a STEM exhibit, their exploration of evidence was longer, broader, and more relevant than with children who experienced the exhibit independently.<sup>17</sup>

Wolf and Wood noted that parents’ beliefs regarding guiding their children’s learning are often divergent from ideas highlighted by museum professionals and researchers, despite the positive influence of parental involvement on children’s learning found in children’s museums.<sup>18</sup> For instance, approximately 60% of the interactions at children’s museums are child-initiated, while 32% are parent-initiated, and 8% are mutually initiated. Three major barriers in parent’s involvement in play and informal learning are: a lack of parental awareness concerning the benefits of involved play at children’s museums; a lack of confidence and knowledge of how to play with their children in a children’s museum; and the nature and design of children’s museums may not fully encourage and facilitate parent involvement. Consequently, parents discomfort or hesitation to play in public can lead them to simply watch instead of interact while their children play.



*Figure 11: Visitor’s level of parent engagement*

These findings were echoed in OED’s survey results. For instance, 71% of the visitors (mostly frequent visitors) preferred their child to play independently. Nonmembers were more likely to be engaged with their child compared to members, with 66% of nonmember respondents preferring to be engaged in some, most, or all museum activities compared to 50% of members respondents. This trend could be justified by a higher level of trust and familiarity among

<sup>17</sup> Crowley, K., Callanan, M. A., Jipson, J.L., Glaco, J., Topping, K., & Shrager, J. (2001). Shared scientific thinking in everyday parent-child activity. *Science Education*, 85, 712-732.

<sup>18</sup>Wolf, B., & Wood, E. (2012). Integrating scaffolding experiences for the youngest visitors in museums. *Journal of Museum Education*, 37(1), 29–38.



members towards museum activities than nonmembers, who might be more inquisitive about museum activities as they do not visit as frequently.

## Partnerships

### Value of Partnerships

Literature, case studies, and interviews with comparable children's museums identified partnerships as being important to the continued success of these organizations. Friedman notes that forging meaningful partnerships is crucial to financial, intellectual, and social sustainability of children's museums, especially considering the declining attendance and revenues associated with these organizations.<sup>19</sup> Partnerships are valuable to museums in a number of ways. In some cases, a partner may provide in-kind financial support to an organization, while, in other cases, a partner may collaborate with a museum for program/exhibit development.

The landscape for partnerships, however, is changing. Literature suggests that museums relied on corporate sponsorship to fill gaps in operating expenses during the late 20th century. Expectations for partnerships have evolved from unrestricted funding to companies and organizations expecting some sort of return on investment or impact to accompany these partnerships. Museums are adapting their partnership model to engage a broader group of organizations for more specialized purposes.<sup>20</sup>

While the landscape for these partnerships is changing, clear expectations and mutual benefit remain at the core of any successful partnership. Organizations should have a clear understanding of their strengths and the needs that stem from their challenges. Collaborators and partners should ideally complement the organization's strengths and at least partially meet the needs of the museum. Overall, museums should be intentional about the organizations they pursue partnerships with. Successful partnerships are also explicit about project benefits to ensure that both organizations can enjoy the fruits associated with these collaborations.

### Types of Partners

Many museums have successfully partnered with federal, state, and local government, businesses, nonprofits, and other community organizations. Federal partnerships are increasingly common in children's museums. Museums have partnered with the National Science Foundation (NSF), NASA, and the National Parks Service (NPS) to support new exhibit development. State sponsorship in the form of collaborations with Higher Education Institutions has become more common, especially in Children's museums located near Universities. Corporations and local businesses are potential partners for museums; however, literature notes that these partnerships are becoming increasingly less common.<sup>21</sup> Nevertheless, some children's

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<sup>19</sup> Friedman, pp. 3-5

<sup>20</sup> Friedman, Alan J. (2007). The Great Sustainability Challenge: How Visitor Studies Can Save Cultural Institutions in the 21st Century. *Visitor Studies*, 10(1), p. 6.

<sup>21</sup> Friedman, p. 6

museums successfully leverage these types of sponsorships. Partnerships with local governments and organizations can also be beneficial to children's museums. Local school districts, for instance, have partnered with museums and other funders to provide field trips amidst budgetary challenges.<sup>22</sup> Nonprofits are also oftentimes meaningful partners for museums.

It is important to note that each partner faces unique challenges that could impede partnership. The federal government and many state and local governments faced deep budget cuts during the great recession, the effects of which still influence the way public sector entities operate today.<sup>23</sup> The private sector also felt sharp cuts during the recessionary period, resulting in downsizing, layoffs, and increased restrictions on spending.<sup>24</sup> Finally, nonprofits and other funding organizations are seeing more competing interests in making funding decisions.<sup>25</sup> Overall, an increasing number of entities are approaching traditional partners for funding. The decreasing amount of available funding, paired with increased demand for partnership, has made this environment considerably more competitive for museums and especially smaller museums.<sup>26</sup>

## Types of Partnerships

Museums may engage partners for a wide variety of activities. The specific type of partnership a museum enters into, however, is largely influenced by the type of partner they are engaging. For instance, a museum that partners with a federal or state agency might receive funding or support for a new exhibit while a museum partnering with a local business might receive in-kind contributions. Regardless of the partner, certain elements of partnerships have changed. Most notably, the unrestricted funding many museums previously enjoyed through foundation grants and sponsorship has declined significantly.<sup>27</sup> Partnerships have instead evolved into more project-based, results-driven collaborations that tend to be more "one off" rather than ongoing.<sup>28</sup>

Federal funding closely follows this new model for museum partnerships. Federal partnerships are often borne through competitive application processes where museums submit projects for

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<sup>22</sup> Koebler, Jason (2011). Teachers: Don't Overlook the Value of Field Trips. U.S. News & World Report. Retrieved from: <https://www.usnews.com/education/blogs/high-school-notes/2011/12/12/teachers-dont-overlook-value-of-field-trips>

<sup>23</sup> Pew Trusts (2019). 'Lost Decade' Casts a Post Recession Shadow on State Finances. Retrieved from: <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2019/06/lost-decade-casts-a-post-recession-shadow-on-state-finances>

<sup>24</sup> Mitchell, Daniel J.B. (2013). Public and private sector jobs and the great recession. Bureau of Labor Statistics. Retrieved from: <https://www.bls.gov/opub/mlr/2013/book-review/public-jobs-and-political-agendas.htm>

<sup>25</sup> Nonprofit Source. (2018). Charitable Giving Statistics. Retrieved from: <https://nonprofitsource.com/online-giving-statistics/>

<sup>26</sup> Nightingale, Julie. (2008). Attracting Corporate Sponsors. Museums Association. (42), 56-67. Retrieved from: <https://www.museumsassociation.org/museum-practice/fundraising/16530>

<sup>27</sup> Friedman, p. 6.

<sup>28</sup> Beth Maloney & Matt D. Hill (2016). Museums and Universities: Partnerships with Lasting Impact, *Journal of Museum Education*, 41(4), 247-249

funding based on alignment with a federal priority or initiative. The Institute for Museum and Library Services (IMLS), for example, has emerged as a notable source of federal funding for museums, providing \$25,576,662 in funding for 211 museum projects through their Museum's for America and National Leadership Grants for Museums programs in 2014.<sup>29</sup> The Children's Museum of Cleveland received \$75,000 in IMLS funding to develop a new history exhibit.<sup>30</sup> Other federal agencies have emerged as sources for project based funding. For instance, the port exhibit at Baltimore's Port Discovery Children's Museum received \$50,000 in funding from the National Parks Services' Maritime Heritage Grant program.<sup>31</sup>

Museums may partner with federal entities to host events or travelling exhibits. For instance, the Utica Children's museum partnered with NASA in 2007 to host a "Mars Event" where guests were able to interact with the Chairman of the House Science Committee, NASA's lead scientist for Mars exploration, and Astronaut Ken Cockrell.<sup>32</sup> The National Science Foundation (NSF) also provides children's museums with the opportunity to host a travelling exhibit. The NSF's popular "Race: are we so different?" exhibit is an approximately 5,000 sq. foot display that overviews the science and history of race and lived experiences of race in America. The display has traveled to 45 museums since 2007, typically remaining in-place for three to four months.<sup>33</sup> While these partnerships are not as financially substantive as grant funding for exhibit/program development, they can be instrumental in boosting attendance and attracting new members.

Universities have been a longstanding resource for museums, however, the nature of these partnerships is also changing. Literature and interviews with three museums located in "college towns" uncovered that few -if any- children's museums have substantial financial relationships with universities. Rather, these partnerships arise on a case-by-case basis, usually terminating with the close of a semester or academic year.<sup>34</sup> Universities often partner with children's museums to develop exhibits and programming. University engineering and education departments have proven to be a useful resource for children's museums in the exhibit design process, according to interviews with "college town" museums. A senior design team at California Polytechnic and State University created the "circuit lab" exhibit aimed at explaining electrical circuits and currents for the nearby San Luis Obispo Children's Museum.<sup>35</sup> Similarly, a team of

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<sup>29</sup> Lee, Adrienne. (2014). Federal Grants of \$30 Million Awarded to Support Museums across the U.S. Institute for Museum and Library Services. Retrieved from: <https://www.ims.gov/news/federal-grants-30-million-awarded-support-museums-across-us>

<sup>30</sup> Grants Plus. (n.d.). Client Spotlight: The Children's Museum of Cleveland. Retrieved from: <https://grantsplus.com/how-the-childrens-museum-of-cleveland-secured-its-first-federal-grant-for-a-new-exhibit/>

<sup>31</sup> National Parks Service. (n.d.). National Maritime Heritage Grant Recipients. Retrieved From: <https://www.nps.gov/maritime/grants/recipients.htm>

<sup>32</sup> McLemore, Chris. (2004). Mars Event at Children's Museum. National Aeronautics and Space Administration. Retrieved from: [https://www.nasa.gov/audience/foreducators/informal/features/F\\_Mars\\_Event\\_at\\_Museum.html](https://www.nasa.gov/audience/foreducators/informal/features/F_Mars_Event_at_Museum.html)

<sup>33</sup> American Anthropological Association. (n.d.). Museum: Race-- Are We So Different. National Science Foundation. Retrieved from: [https://www.nsf.gov/news/now\\_showing/museums/race.jsp](https://www.nsf.gov/news/now_showing/museums/race.jsp)

<sup>34</sup> Maloney & Hill (2016) pp. 247-249.

<sup>35</sup> Garcia, M., Higgins, V., & Xie, M. San Luis Obispo Children's Museum: The Circuit Lab. California Polytechnic and State University Department of Industrial and Manufacturing Engineering. Retrieved from:

students at Penn State partnered with nearby Discovery Space of Central Pennsylvania to build exhibits demonstrating various physics phenomena.<sup>36</sup>

Universities can also partner with museums to host important research on early childhood development. Sciencenter- a children's museum in Ithaca, New York- utilized NSF funding to partner with Cornell's Office of Sponsored Projects to host development research within the museum. This partnership also gives parents and caretakers the opportunity to discuss early learning and development with expert researchers and learn about the most recent findings in this field.<sup>37</sup> Museums can partner with universities for a number of other services. For instance, Cornell partners with nearby Sciencenter to offer free membership for new faculty. Additionally, the University actively posts Sciencenter events on their events calendar to keep faculty and students informed. Some universities also host research centers and professional offices, which can be utilized by museums. Children's Museum of Pittsburgh, for instance, partnered with the University of Buffalo Center for Inclusive Design and Environmental Access to certify their exhibits as inclusive and accessible.

Museums can also engage corporations and local businesses in similar ways to federal and state level partners. Program and exhibit sponsorship is an emerging trend among private sector sponsors. The interactive banking exhibit in the Kidtropolis area of the Children's Museum of Houston is sponsored in part by the Bank of America (See Figure 12). Additionally, the Children's Museum of Chicago was gifted a branded skid-steer loader for a construction exhibit by regional equipment manufacturer CNH Industrial.<sup>38</sup> Businesses can also choose to sponsor museum programs and events. Interviews with case study museums highlighted the role of businesses in sponsoring events such as reduced admission nights and afterschool and summer programming. Businesses can also choose to make monetary contributions to museums; however, this is becoming less common, especially for smaller museums.<sup>39</sup> Finally, businesses might engage museums for events, and office parties. Children's Museums have emerged as a popular choice for this as their interactive setting can be used for team and morale building exercises and family-friendly events.

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<https://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1179&context=imesp>

<sup>36</sup> Tomlinson, Stefanie. (2016). Students Engineer New Exhibits for Local Science Museum. Pennsylvania State University News. Retrieved from: <https://news.psu.edu/story/439304/2016/11/27/academics/students-engineer-new-exhibits-local-science-museum>

<sup>37</sup> Sciencenter. (2018). Sciencenter Report to the Community. Retrieved from: <http://www.sciencenter.org/perch/resources/sciar2017pagesfinalhr.pdf>

<sup>38</sup> Gieger Smith, Erin. (2014). Children's Museum Brand Exhibits with Corporate Sponsorship. The Wall Street Journal. Retrieved from: <https://www.wsj.com/articles/childrens-museums-brand-exhibits-with-corporate-sponsorship-1415826288>

<sup>39</sup> Friedman, p. 6.



*Figure 12: Bank of America Branding at the Children's Museum of Houston<sup>40</sup>*

Nonprofits and organizations can engage museums in a number of ways. Organizations might play a role in sponsoring field trip visits, events, and, in some cases, exhibits. The San Luis Obispo Chapter of Rotary International, for instance, has been a longtime sponsor of field trips for local schoolchildren, according to interviews with case study museums. Organizations might also partner in similar ways to federal and state agencies. The Boston Children's Museum received a two-year, \$342,000 grant from the National Science Foundation to partner with the Education Development Center's Children and Technology Program. This partnership will assess the impacts of introducing children to mechanical and engineering activities at a young age.<sup>41</sup>

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<sup>40</sup> Image Source: <https://www.wsj.com/articles/childrens-museums-brand-exhibits-with-corporate-sponsorship-1415826288>

<sup>41</sup> Baxter, J. (2019). Boston Children's Museum Awarded National Science Foundation Grant. Cision PRweb. Retrieved from: [https://www.prweb.com/releases/boston\\_childrens\\_museum\\_awarded\\_national\\_science\\_foundation\\_grant/prweb16478438.htm](https://www.prweb.com/releases/boston_childrens_museum_awarded_national_science_foundation_grant/prweb16478438.htm)

## Expanding the Value

Museum visitors recognize the value the former Children’s Museum of Blacksburg brings to families and the greater New River Valley. Additionally, the museum’s new location in Christiansburg will allow for greater access to market segments not already penetrated by the museum. While these factors are conducive to the success of Wonder Universe, they will cannot deliver the museum’s ambitious goals alone. This section will provide recommendations in light of three broad themes detailed in the section above aimed at expanding the value members and community members recognized in the previous museum. This section briefly discusses the strategies to make the museum more accessible, encourage collaboration and interaction with exhibits and programming, and identify potential partners in the region.

### Expanding the Footprint

The best practices on Children’s Museums describe the importance of selecting the right site for a children’s museum affecting “the economic viability of the museum, programs developed on the site and the future development of the surrounding property.”<sup>42</sup> In addition, literature on sustainability of children’s museum mention that identity (being perceived as neutral), access, parking, expansion and adjacent land uses (a location with several attractions nearby to encourage families to plan a longer outing when they visit the museum) are important factors in a successful site selection, many of which apply to Wonder Universe location.

Survey results suggest that Wonder Universe’s new location will support their ongoing expansion. OED asked survey respondents which town in the New River Valley they visited the most for shopping, dining, etc. and if the respondents anticipated visiting the museum more or less in its Christiansburg location. Approximately 68% of survey respondents indicated that Christiansburg was their primary shopping, dining, and entertainment destination, followed by Blacksburg (24%) and Radford (4%). Many survey respondents also indicated that they were more likely to visit the museum in its Christiansburg location. Interestingly, approximately 72% of nonmember respondents indicated that they would visit the museum either “more” or “much more” in its Christiansburg location, compared to only 42% of member respondents (shown in Figure 13). While OED’s survey results are not comprehensive, preliminary data suggests that Wonder Universe will be more accessible to a greater number of families in its Christiansburg Location.

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<sup>42</sup> Regnier, V. (1987). The Children’s Museum: Exhibit and Location Issues. *Children’s Environments Quarterly*, 4(1), p. 55.

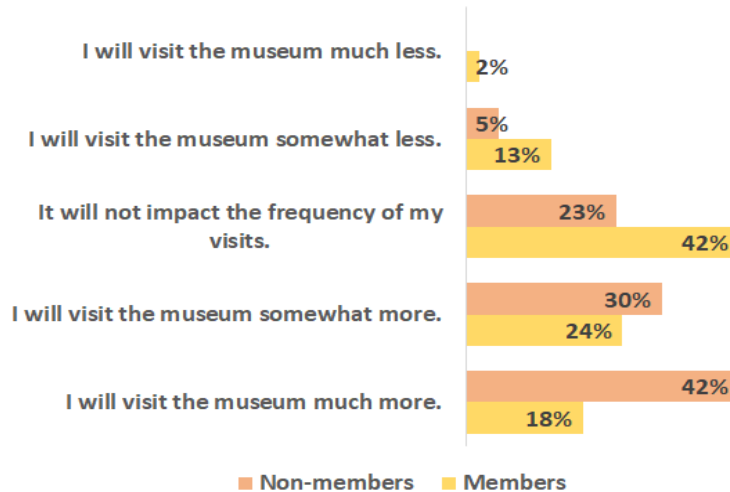


Figure 13: Anticipated Museum Visit Frequency in New Location

The museum’s move to Christiansburg will also be accompanied by an approximately 6,000 sq. ft. increase on the museums previous floorspace. This expansion will allow for new exhibits and an increased capacity for visitors. The previous location, for instance, had a capacity of approximately 150 guests, although administration noted that crowding was an issue at that occupancy. Administration hopes the new location will be able to accommodate 200 guests comfortably and 300 guests at maximum. Increased capacity will mean increased expenses for Wonder Universe. Historically, the museum has operated at a loss. For instance, the museum collected \$89,324 in revenue and spent \$138,435 for 2018. Administration noted that 2018’s deficit was worsened by allocating most donations to the construction of Wonder Universe. While it is not uncommon for museums to operate at a loss, Wonder Universe will need to attract more members and guests to keep pace with expense projections of \$311,291 for the upcoming fiscal year.

Wonder Universe will need to better access the New River Valley in order to attract the number of visitors required for financial viability. Museum administration projects revenue at \$284,100 for the upcoming fiscal year. Additionally, the museum has set a goal of attracting 45,000 guests to its new location during the first year of operation. This marks a more than 200% increase in revenue alongside more than double attendance. While the introduction of tiered membership and a three-dollar increase ticket pricing should account for more revenue per visitor, the museum will need to attract thousands of new members and visitors to meet its goals. This challenge is exacerbated by the relatively close location (42 miles) of a competing Children’s Museum. Roanoke’s Kid’s Square Children’s Museum attracted 72,000 guests in the past year and is comparatively more established in its respective region. Additionally, 16.3% of the region’s workers were employed in the Roanoke Region for 2017, suggesting that Kid’s Square has some penetration within the New River Valley.<sup>43</sup>

<sup>43</sup> On the Map: U.S. Census Bureau (2017).

Wonder Universe has an opportunity to better engage existing and new markets within the New River Valley. As mentioned in the “expanding the value” section of this report, member families were typically wealthier and larger compared to nonmember families and the average regional family. Members of Wonder Universe tend to be within the region’s upper middle class, although the museum could further penetrate this demographic. For instance, the former Children’s Museum of Blacksburg had approximately 400 member families in 2018. Approximately 20% (13,214) of the region’s 69,179 households earned over \$100,000 in 2017 according to the most recent census data. Furthermore, there are 3,606 families with children under age six and 2,667 families with one child under the age of six and one child between ages 6-17. If OED’s survey data is indicative of member characteristics, census data suggests that a large portion of the “member” demographic remains untapped.

Wonder Universe will also have to access new markets to meet its attendance goal for the upcoming year. Survey and Census data suggest that the average nonmember family is similar to the average regional family in terms of wealth and size, suggesting that Wonder Universe is also not capturing middle-to-lower-income families in the region. The majority (47%) of nonmember survey respondents earned between \$50,000-\$99,999 annually, with 21% earning more than \$100,000 annually and 31% earning less than \$49,999 annually. This compares with approximately 30% of regional households earning between \$50,000-\$99,999, 20% earning above \$100,000, and approximately 50% earning less than \$49,999. Nonmember and regional families are also more likely to have one child. At the previous ticket (\$5/visit) and membership price (\$100/yr.), a single-child family would have to visit the museum approximately 10 times to make membership financially viable (See Figure 14). Additionally, survey data suggests that nonmembers are far less likely to visit the museum compared to their member counterparts, with 93% of nonmembers indicating less than one visit per month or that they had not visited the museum in the past year.

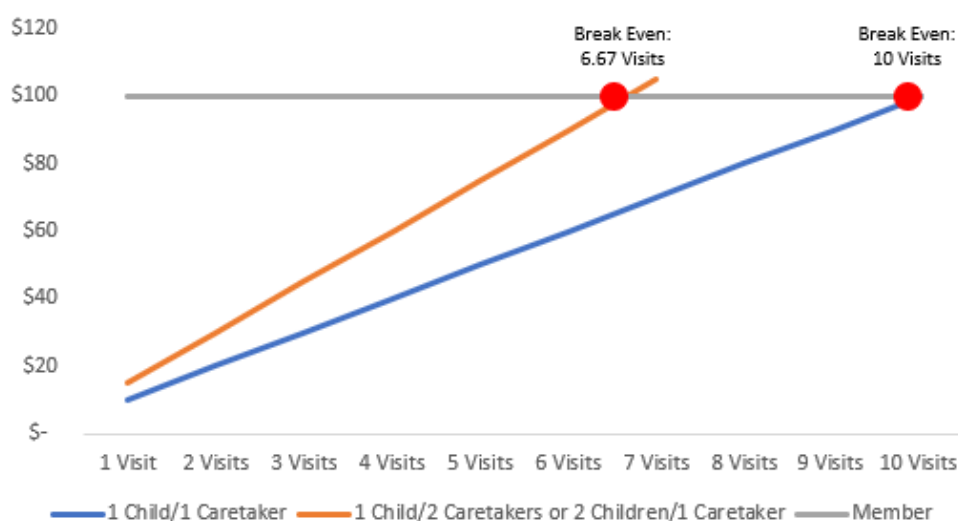


Figure 14: Membership Break Even Points for Nonmember Families

Families with middle-to-lower average annual income are not traditional members of children’s museums, however, according to ACM’s report, “Museum for All”, identifying those families and



providing them with information on museum offerings does little to change visitation habits.<sup>44</sup> Museums must invest in understanding the motivations of these families and the challenges they confront (e.g., paying attention to available hours of working parents who cannot afford a babysitter). Wonder Universe's plan for partnering with manufacturing companies and offering reduced-price membership to their employees will be a positive step toward diversifying its member base. However, it is important to find and negotiate ways to accommodate the needs and expectations of this target group (e.g., offering certain days and hours, weekend packages, parent education programs and etc.).

Accessibility is a leading factor in increasing membership. Wonder Universe should consider building relationships with individual families to better understand their needs. Additionally, the museum could distribute free passes to local agencies and community service boards to increase local access to the children's museum. Wonder Universe could utilize grants, such as those offered by AmeriCorps VISTA, to either partially or fully cover the cost of free memberships. Specifically, the AmeriCorps Vista program provides funding for programs aimed at families and children in need. The grant has several focus areas, the most relevant of which is educational equality. Additionally, more flexible membership options with the demographics and tendencies of the region in mind could increase memberships among lower income families or smaller families for which membership is not financially prudent at a low frequency of visits.

The New River Valley also has a culturally diverse population, with many families immigrating for academic and employment opportunities at the region's institutions of Higher Education. For instance, growth in the Region's Asian (19.5%) and Black and African American (15.4%) Cohorts outpaced growth in the region's white population (1.65%) from 2010 to 2017. It is important to note that census figures do not fully capture these populations, especially those families who are temporarily located on work and education visas. Wonder Universe could better access this market through hiring bilingual staff/volunteers and offering bilingual materials (e.g. through QR codes).

Survey respondents noted that Wonder Universe was an important asset for children with intellectual and physical disabilities. Broadening the museums offerings to accommodate for these families could be another opportunity to specialize and access new markets. Additionally, studies suggest that exhibits that particularly focus on the needs of diverse learners, help other participants learn in a more effective manner. Wojton et al. found that by using methods that accommodate the blind, museum educators create stronger museum education programs for everyone.<sup>45</sup> Opportunities for tactile interaction or sound amplification increases the sensory and auditory experiences for all participants.

Beyond accessing new demographics and markets, Wonder Universe could invest in more traditional membership recruitment strategies. As mentioned earlier, a more flexible membership scheme could help to recruit smaller families that were previously better served by

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<sup>44</sup> Migus, L. H. (2014). Museum for All. Association of Children's Museums. Retrieved from: <http://www.childrensmuseums.org/images/h2hsummer14web.pdf>

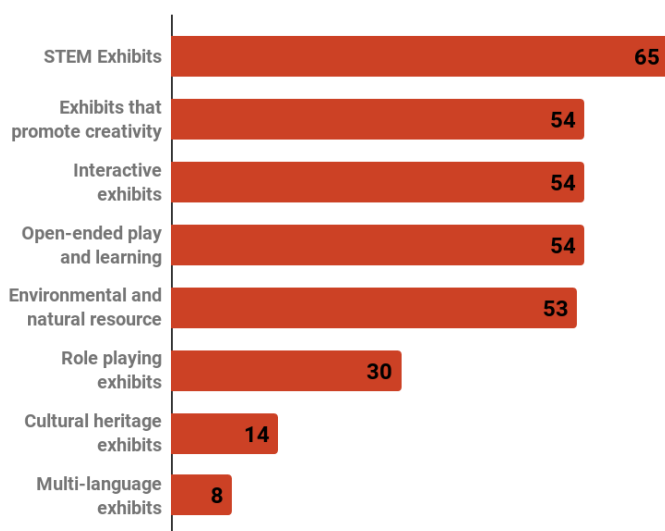
<sup>45</sup> Wojton, M. A., Heimlich, J., & Shaheen, N. (2016). Accommodating Blind Learners Helps All Learners. *Journal of Museum Education*, 41(1), 59–65. //doi.org/10.1080/10598650.2015.1126150

paying admission. Providing senior discounts and grandparent specific memberships could also attract new member families. Grandparents and Retirees tend to be more time-rich compared to their employed or younger counterparts and therefore able to visit the museum more. Member events or member-only days can also give members a sense of appreciation and can be important for fostering community or a sense of belonging amongst member families. Finally, marketing, especially digital marketing, is imperative for children’s museums. Marketing efforts can be important for increasing awareness for the museum and attracting new members. Additionally marketing is important for informing, engaging, and ultimately retaining existing members.

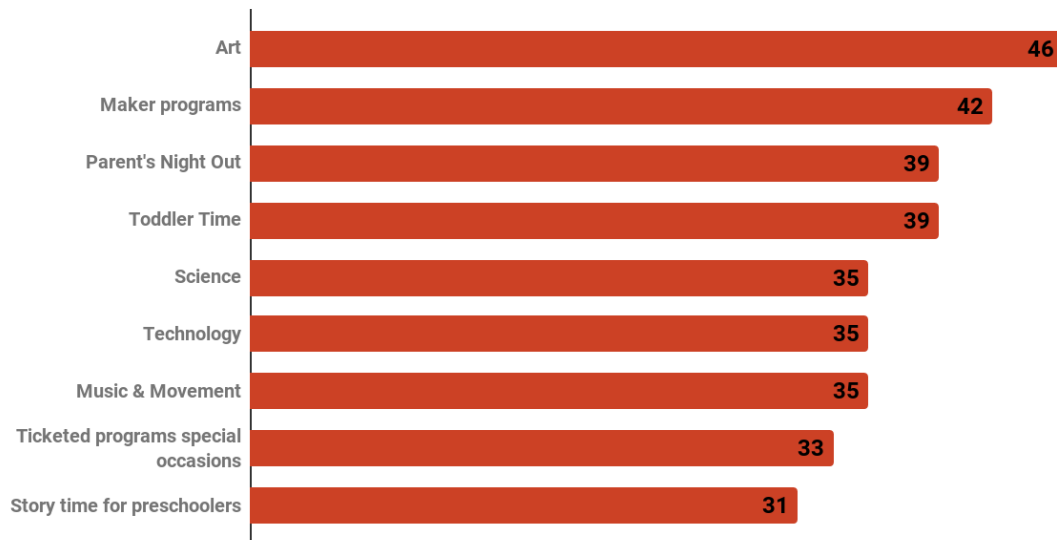
## Developing Innovative and Collaborative Exhibits and Programs

Visitors of CMB were largely satisfied with the exhibits offered at the previous space, according to survey results. Visitors tended to be less satisfied with programmatic offerings, although it appeared that museum users were less familiar with these offerings. Wonder Universe has an opportunity to expand their exhibit offerings in their new space by developing new exhibits and improving existing exhibits that will be transitioned from the previous location. Literature suggests that successful exhibits are typically simple, require little to no formal instruction, and are both physically and mentally engaging. Unsuccessful exhibits tend to present too much information, are not relatable to a child’s experience, and require some sort of training or instruction.

OED asked survey respondents what types of exhibits and programs they would like to see implemented in the new location. Results largely resembled findings from the literature and case studies, with STEM exhibits being the most popular, followed by exhibits that were open-ended, interactive, and promoted creativity (Figure 15). Programs received more mixed responses, with art programs narrowly leading respondent preferences. “Maker” programs, a parent’s night out program, and toddler time program were also popular choices among survey respondents.



*Figure 16: Desired Future Exhibits*



*Figure 17: Desired Future Programming*

There are several strategies Wonder Universe can employ to expand and improve its current exhibits and programming. Overall, however, it is important that museum staff develops a strong understanding of what exhibits and programs will look like in Wonder Universe. The museum must be intentional in how it transitions existing exhibits into their new space and how they develop new exhibits in the new frame of Wonder Universe. Having a clear and communicable concept of what exhibits and programs will look like in the new space and what is to be expected of these offerings is crucial to unifying the museum experience and evaluating the success of exhibits and programs in the future.

STEM (science, technology, engineering, and math) is a popular and growing trend in early childhood development and primary education. Demand for STEM increased STEM offerings was echoed in survey results, with respondents favoring this variety of exhibit over seven other choices gathered from literature and case studies. Interestingly, however, respondents indicated the least satisfaction with CMB's STEM offerings, namely the museum's "STEM Sundays" program. Wonder Universe should seek to understand why their initial STEM offerings were deemed unsatisfactory by museum users and apply that feedback toward developing new STEM exhibits. Engaging a select group of parents to both troubleshoot issues with STEM Sundays and look towards new STEM options for the museum might be a useful starting point for the museum.

Survey respondent's demand for more hands-on, creative, and open-ended play and learning exhibits also echoes trends identified in the literature and case studies. Adding and combining creativity components to existing exhibits and programs could be a lost-cost step towards accommodating this demand. Introducing multisensory stimulation into more basic or informational offerings can greatly enhance the museum experience for children. For instance, story-telling programs can be greatly enhanced by basic visual cues, such as puppets, simple backdrops, or basic props. The "Listen, Look, & Do" program at DC Postal Museum is another strong example of incorporating physical props into existing exhibits. In this example, children

are given the opportunity to play and collaborate with musical instruments after an interactive reading of *Duke Ellington: The Piano Prince & His Orchestra*.

Many children's museums are also experimenting with a "maker space" concept, where innovation and creativity are encouraged through hands-on experiences. More specifically, maker spaces rely on one's own action and activity, rather than traditional pre-constructed and rule-based activities; foster cooperative play, community, and communication; allow for and encourage physical interaction; and prioritize fun in learning. Much of the maker experience is dependent upon time, with makers potentially spending hours on a particular project. This typically reserves maker-space activities for smaller numbers of children. Additionally, maker spaces typically require more space than a traditional children's museum exhibit. Finally, it can be difficult to judge the success or meaningfulness of maker spaces in that the activities these spaces produce are largely interpretive and open-ended. Wonder Universe can look toward the Children's Museum of Pittsburgh's MAKESHOP and San Francisco's Exploratorium® as examples of how children's museums can facilitate making and similar hands-on learning projects.

### Increasing Adult-child Interaction

Survey results confirmed a lack of adult-child interaction in the former Children's Museum of Blacksburg. It is important to note, however, that this is not limited to CMB, but rather an issue that all entities vested in early childhood development are trying to overcome. Combining the interests of both children and adults in the exhibit development process is a leading strategy in increasing parental interaction at Children's Museums. Ideally, an exhibit should foster attentiveness and enchantment in both children and parents, therefore, it is crucial to have inputs from both user groups at the design stage of these exhibits.<sup>46</sup>

An example of this collaborative design process is the Boston Children's Museum's "Kid Power" exhibit. The museum took a comprehensive and collaborative approach towards developing an exhibit that was both informative for children and parents while also fostering play and interaction. An advisory board comprised of families, museum staff, and public health experts was created to guide the design process of this exhibit. Namely, the board conducted focus groups to determine what families already knew about health and fitness and what their barriers are to leading a healthier life. Busy families claimed that they prefer to spend their limited time together, rather than individual family members taking the time to exercise. As a result, the Kid Power exhibit was built to allow two or more people to participate at the same time, rather than one person playing alone, in an effort to encourage interaction and conversation among adults and children.

Overall, a successful exhibit provides a unique, museum-style experience that provides families with activities simple and familiar enough to where they could extend into daily life. Wonder Universe should consider the following when modifying existing exhibits or developing new

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<sup>46</sup> Birch, J. (2018). Museum spaces and experiences for children – ambiguity and uncertainty in defining the space, the child and the experience. *Children's Geographies*, 16(5), 516–528, p. 524. Retrieved from: <https://doi.org/10.1080/14733285.2018.1447088>

exhibits with parental interaction in mind: design, play, facilitation, and support. First, Wonder Universe should be intentional in designing exhibits where adults can quickly and easily recognize their support role by providing information that supports scaffolding during the individual exhibit experience. Wonder Universe should also explicitly associate unstructured play with learning, potentially by connecting the dots between play and the skills needed for academic success. Additionally, training staff to effectively facilitate play between parents and children is essential to overcoming the resounding unfamiliarity of how parents can enter and support their child's play in the museum setting. Relatedly, Wonder Universe can further support parents as partners in play by offering on-or-off site training sessions, lectures, online resources, and basic information on the importance of play and informal learning and the fundamentals of scaffolding.

## Partnerships

Expanding partnerships should be among Wonder Universe's first priorities. Partnerships often account for gaps in traditional revenue streams, allow for innovation beyond budgetary restrictions, and are considered to be essential to the high level of service associated with children's museums.<sup>47</sup> As mentioned in the understanding the value section of this report, federal and state agencies, institutions of higher education, corporations and local businesses, and nonprofits and local organizations traditionally partner with museums. This section will provide recommendations for how Wonder Universe could better engage with these entities.

Federal grants should be Wonder Universe's first consideration when investigating partnerships and funding. Federal funding oftentimes offers the highest award amounts of most museum funding sources and have become an increasingly common resource for museums. The average museum, for instance, collected 19.7% of its revenue through government support in 2006, according to an IMLS study.<sup>48</sup> American Children's Museum Association data suggests that this number is higher for children's museums, with some small museums collecting up to 22%.<sup>49</sup> There are many grants that could be applied towards museum funding, however, museums should be intentional in targeting grants with the potential to resolve or abate their most pressing issues. Prior to the grant writing process, Museums should work to inventory their needs and goals with special attention given to what could be most feasibly resolved or attained. Furthermore, museums should look to grant opportunities with the capacity to address multiple problem areas or goals. Administrators should frequently scan grant databases for upcoming opportunities. Additionally, museum staff might look to the successes of peer museums for further guidance in this process.<sup>50</sup>

Several factors can influence the success of a grant proposal. It is important to note, however, that writing proposals is time consuming and not are successful. Several sources place the proposal success rate for federal grants at approximately 20%, although larger organizations are

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<sup>47</sup> Geiger Smith, Erin. (2014).

<sup>48</sup> Woody, Rachel C. (2018). A Survivor's Guide to Museum Grant Writing. Lucidea Press. pp 1-4. Retrieved from: <http://bit.ly/survivorguidetomuseumgrantwriting>

<sup>49</sup> Association of Children's Museums. (n.d.). Birds of a Feather: Small Children's Museums. pp. 70-76.

<sup>50</sup> Woody, Rachel C. (2018). pp. 21-25

typically more successful than their smaller counterparts.<sup>51</sup> Museums should be consistent and proactive in proposal writing, successful or not. Museums should focus on the following elements when writing proposals: mission alignment with funding agency; clear proof of concept; clear project timeline and cost; demonstrated collaboration with peer organizations; collect strong letters of support; and demonstrate other investments in the project.<sup>52</sup>

Wonder Universe has a unique opportunity to leverage its surroundings and membership base to better engage regional institutes, local governments and businesses, and nonprofits and organizations. OED asked survey respondents where they (or a spouse) worked to better understand what regional partnerships could be available to the museum. Results uncovered a strong relationship between the former Children’s Museum of Blacksburg and places of higher education in the region, local schools and hospitals, and several large businesses. Virginia Tech, Radford University, and the research institutes and university offices attached to these entities employ the majority (42% of members/35% of nonmembers) of museum visitors (shown in Figure 16). The remainder of museum users worked at various businesses and organizations throughout the region. The Radford Ammunition Plant (operated by BAE Systems), MOOG, New River Valley Community Services, Shelor Motor Mile, and Modea were among the most popular choices for the “other” category. Additionally, a small number of museum users (2%) indicated employment at the region’s numerous large manufacturing firms. Overall, member parents were more likely to work in postsecondary and secondary education. Nonmember parents were more likely to be employed in the region’s many retail and traded sector firms.

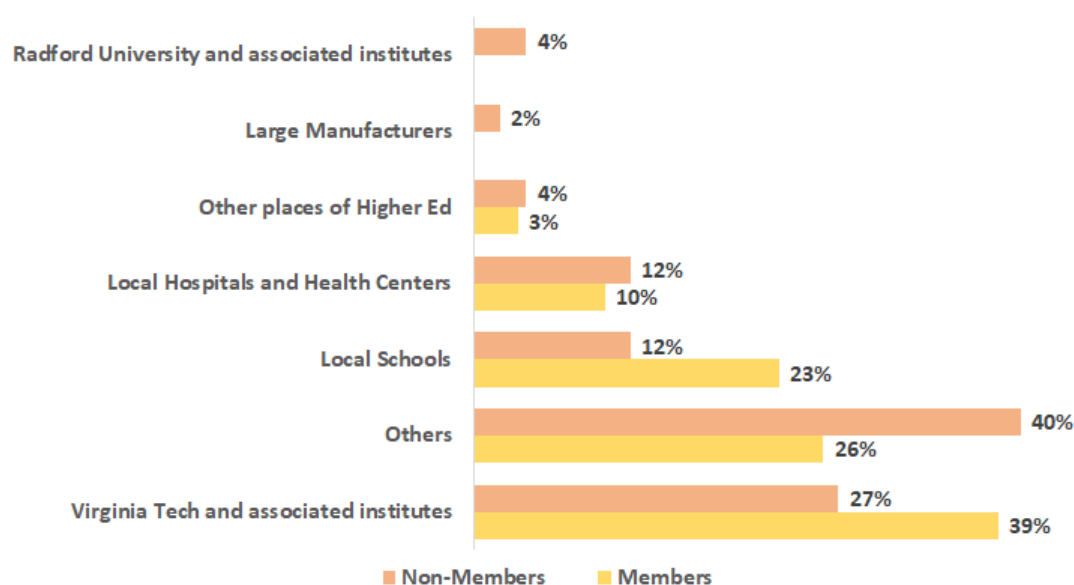


Figure 16: Survey Respondents by Place of Work

<sup>51</sup> University of California Institutional Research & Academic Planning. (2017). Federal Proposal Success Rate. Retrieved from: <http://bit.ly/federalproposalsuccessrate>

<sup>52</sup> Woody, Rachel C. (2018). pp. 21-25

Museum-university partnerships are cited throughout the literature as being mutually rewarding and beneficial for both parties. Additionally, the representation of Virginia Tech and Radford faculty and staff in Wonder Universe's membership makes these two entities an obvious choice for partnership. It is important to note that university partnerships are typically service-based and typically terminate within the span of an academic semester or year. While these more short-term projects are nevertheless beneficial to museums, Wonder Universe should aim for a broader partnership that is more conducive to repeated collaborations. Integrating undergraduate coursework with museum operations, or allowing students to apply their knowledge in a professional environment, is cited as a leading strategy for expanding the museum-university partnership. Internships also give students practicum opportunities in addition to allow museums to engage students for specialized tasks that might be out of the purview of conventional museum staff. Most progressively, some museums have explored mission and operations integration with partner universities to build on their mutual strengths. Some partnerships have formed to better promote and disseminate important research through grant coordination and programs and activities that effectively communicate this research to the public.<sup>53</sup>

While these recommendations might seem aspirational, smaller steps towards a more meaningful partnership could be easily implementable. For instance, Wonder Universe could engage Virginia Tech's popular Human Development program to assess their need for fieldwork and practicum opportunities for students. Additionally, Virginia Tech and Radford offer a wealth of students eager for summer internship opportunities and marketable work experience. Partnering with departments across both institutions could give museum access to affordable and specialized labor for tasks or projects that would traditionally require a consultant or extra staff member. As mentioned above, mission and operations integration is the most intensive form of museum-university partnership, however, is not out of the museum's grasp. "One-off" partnerships with regional universities could culminate in a more meaningful relationship for both parties. Beyond Maloney and Hill's suggestions, Wonder Universe could look to simpler partnership options, such as one similar to Cornell partnering with nearby Sciencenter to offer free membership to new faculty members.

Wonder Universe could also turn to local and regional governments for partnership. Museum-school partnerships, for instance, are becoming increasingly common across children's museums nationwide. These partnerships can range from sponsoring field trips to engaging in afterschool programming and curriculum development.<sup>54</sup> For example, the Children's Museum of Houston hosts after school STEM workshops at a local middle school where students are able to use museum resources to create their own projects.<sup>55</sup> These partnerships are unique in that the museum acts as the service provider rather than recipient. Nevertheless, these partnerships are important for fulfilling the community-centric missions of many museums. A number of

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<sup>53</sup> Maloney & Hill (2016) pp. 247-249

<sup>54</sup> Hall, J. (2012). *To Infinity and Beyond: Museum-School Partnerships Beyond the Field Trip* (Unpublished master's thesis). Seton Hall University.

<sup>55</sup> Children's Museum of Houston. (n.d.). Outreach Programs. Retrieved from: <https://www.cmhouston.org/outreach>

museums, and specifically children's museums have successfully partnered with local governments through marketing their services as a regional asset. Children's museums are an important factor for site selection as more families recognize the benefits of early childhood development. Additionally, museums can serve as magnets for out-of-region tourists.<sup>56</sup> The Children's Museum of Richmond successfully made this case with local economic development offices, attracting a \$40,000 grant from the Chesterfield County Economic Development Authority.<sup>57</sup>

Wonder Universe should also investigate corporate and business partnerships. Businesses choose to partner with museums for a number of reasons, the outcomes of which take many different shapes. Some businesses may choose to partner to demonstrate their corporate social responsibility (CSR) while others may enter into partnerships expecting some return on investment or impact. Overall, it is important to note that sponsorship decisions are not made uniformly. Developing a clear and marketable understanding of a museum's reach, impact, and operations, however, is crucial for sponsor attraction- museums that can demonstrate prestige, proven access to a certain demographic or market, and operational efficiency and competency are more likely to be candidates for partnership or sponsorship. Museums can take a more conventional approach to sponsorship by displaying a banner or sign representing a company's logo in return for a monetary sponsorship. Museums may also approach local businesses to support events, such as free or reduced admission nights or afterschool and summer programming. More progressively, Wonder Universe could make the case for partnership with growing firms by adapting Cornell's model of offering museum membership as a benefit for relocating employees as employment continues to grow in the New River Valley. Wonder Universe could also partner with businesses that complement their services. A museum-hotel partnership in San Luis Obispo, for instance, has been successful in diverting wine-country tourists to the local children's museum.

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<sup>56</sup> American Alliance of Museums. (2017). Museums as Economic Engines. Retrieved from: <https://www.aam-us.org/wp-content/uploads/2018/04/American-Alliance-of-Museums-web.pdf>

<sup>57</sup> Children's Museum of Richmond. (2019). 2018 Impact Report. Retrieved from: [https://www.childrensmuseumofrichmond.org/files/4315/4108/1287/ImpactReportFY18\\_FINAL-web.pdf](https://www.childrensmuseumofrichmond.org/files/4315/4108/1287/ImpactReportFY18_FINAL-web.pdf)



# Appendix A: Comparative Cases

## National Cases:

### Children's Museum of Houston

**About:** The Children's Museum of Houston (CMH) in Texas is well suited for children 10 and younger. The museum's mission is to transform communities through innovative, child-centered learning. connects children and families with experiences that they can customize to suit their own learning interests. These experiences are designed to offer foundational learning opportunities, provide parents with the support they need in their role as the first teachers of their children, and reinforce learning that occurs in school. Equally important are ongoing efforts to remain accessible and welcoming to those with special needs.

**Membership:** All members receive the following benefits:

- Unlimited free admission for one full year.
- Express line for faster service.
- Early Bird Members Hour – Second Saturday of the month from 9 a.m. to 10 a.m. at the Children's Museum of Houston.
- Members' First Friday – No reserved school groups the first Friday of every month at the Children's Museum of Houston.
- Invitations to Members-Only Halloween and Holiday Parties.
- Discount on our fantastic Birthday Party Packages.
- The membership benefits are also available at the Fort Bend Children's Discovery Center.

The museum has four membership levels to attract visitors. These memberships include all the benefits mentioned above and more:

- Achiever - \$135
- Thinker - \$155
- Adventurer - \$180 (considered as best value membership)
- Innovator - \$500
- Crew - \$1000

**Admissions and Target Audience:** Children's Museum of Houston serves an audience of more than 1 million children and families each year. The museum has been in operation for the past 40 years. Average annual onsite attendance is approximately 799,000 with another 450,000 served through offsite, out of school programming at 430 locations throughout the Houston area, in collaboration with 949 community partners. According to the museum's annual report, the total number of visitors has increased by 26% (in the last 5 years) for an increase of about 4.7% annually. For the year 2018, overall visits and participation reflect Houston's area demographics with 48% Hispanic/Latino, 23% African American, 21% Anglo American and 7% Asian American.

**Exhibits and Programming:** The Museum's thirteen bilingual exhibits and seven out-of-school and summer programs engage children in educational activities that are directly aligned with the Texas Essential Knowledge and Skills (TEKS) standards that structure education in the public-school system. CMH also provides delivering services at 208 locations where children with the highest levels of need live. CMH promotes the development of interest-driven knowledge and skills through involvement in realistic, real-world, project-based learning activities in all of the exhibits and programs. Further, the museum's annual report highlight that parents and teachers value the impact of CMH's exhibits and programs, reporting that engagement creates excitement for engagement in STEAM and literacy-based activities, increases content knowledge, improves levels of self-esteem and confidence, motivates children to pursue challenging coursework, and enables children to envision themselves within a variety of career paths.

**Partnerships and Fundraising:** CMH's out of school and summer outreach programs are supported by strategic partnerships formed with 980+ community-based organizations that include schools, afterschool centers, community centers, low-income housing apartments, health clinics, faith-based organizations, homeless shelters and library branches. Partners bring children and families to the Museum and host these out-of-school and summer programs, reducing barriers to participation and contributing to community revitalization. In the year 2017-18, donations worth \$4,878,454 were made to the museum from corporations, foundations, public agencies and individuals for the Museum's outreach programs, operations, exhibits, program development.

## Children's Museum of Indianapolis

**About:** Founded in 1925, the Children's Museum of Indianapolis (CMI) is a nonprofit institution committed to creating extraordinary family learning experiences that have the power to transform the lives of children and families. With a 481,000 square-foot facility situated on 30 acres, it is the largest children's museum in the world. Visitors can explore the physical and natural sciences, history, world cultures, the arts, see how dinosaurs lived 65 million years ago in Dinosphere: Now You're in Their World, experience Dale Chihuly's Fireworks of Glass, and examine children's impact in shaping history in The Power of Children: Making a Difference. The Children's Museum of Indianapolis has won several accolades for its performance and commitment to achieve its mission and vision, including an award from International Sports Heritage Association in 2018.

**Membership:** There are several types of memberships, ranging from individuals to communities. The membership benefits include:

- Free Carousel rides
- Discounts on programs and special events (including the Haunted House)
- Discounts in The Museum Store
- Exclusive members-only events and hours
- Advance tickets for Lilly Theater shows
- Special offers for local attractions or events
- Discount on Treasures of Ancient Greece tickets

The three membership tiers include:

- Basic membership -\$215
- Basic Membership + 2 guests - \$250
- Individual + 1 Membership - \$165

**Admissions and Target Audience:** Admission to the museum for children under 2 are free. For adults (18-59), the admission ticket is \$24 and for Senior (60+) the admission ticket is for \$23. The target audience for the museum is children from ages 2 to 7.

**Exhibits and Programming:** Some of the popular exhibits of the museum include The Riley Children's Health Sports Legends Experience, DC Super Heroes: Discover Your Superpowers, The Science of Ripley's Believe It or Not, Hot Wheels, Race to Win, and Jolly Days. The goal of most of these exhibits is to offer an immersive learning experience that inspires visitors to be active together in a non-competitive way while creating healthy habits that will last a lifetime.

**Partnerships and Fundraising:** The museum's budget for 2017 was \$33.4 million, of which 44% was supported by endowment, 35% from admissions, membership fees, and museum tours, 11% donations from individuals corporations, foundations, The Children's Museum Guild, and other organizations, and 10% came from the program and activity fees, museum store, leased restaurant. The museum has strong partnerships with local schools and universities. The other community partners include Indiana Department of Child Services and Indianapolis Public Library. Some of the museum's community-centered efforts are programs such as Access Pass Program, Children's Museum Neighborhood Club, Star Point, and the Museum Apprentice Program to ensure everyone can have access to the museum. There are also donor memberships. These schemes provide an opportunity to provide a monetary contribution to the museum.

- Discovery Builder Membership - \$285
- Explorer Club Membership - \$500
- Innovator Membership - \$750

## Port Discovery Children's Museum

**About:** Established in 1998, Port Discovery Children's Museum is a non-profit institution located in the historic Fish Market building in Baltimore, Maryland's Inner Harbor. It is 80,000 square feet and offers three floors of exhibits and programs designed to be interactive and hands on, allowing children to learn through play. It receives more than 265,000 visitors annually. The mission of the museum is to educate children and inspire life-long curiosity. The museum has served over 2.5 million visitors and ranks among the top Children's Museums in the U.S. by Parents Magazine (2015) and Forbes (2012). In 2009, Port Discovery received the MetLife Foundation and the Association of Children's Museums Promising Practice Award for their partnership with PACT: Helping Children with Special Needs.

**Membership:** A membership to Port Discovery Children's Museum provides the following benefits to the members and more based on the different tiers.

- Free unlimited admission

- Express entry
- Free member-only events and discounts on special programs
- Sneak peeks at special featured exhibits
- Discounts on birthday parties (10% discount off the base cost of any party package)
- Reduced prices on merchandise in our gift shop
- Discounts at area restaurants and special offers from local businesses and attractions
- Family Plus & Contributing Members also receive discounts on guest admission, half-price admission to other Association of Children's Museum's Member Museums, and more.

The various tiered memberships are:

- Contributing Membership - \$220 (For up to 6 people)
- Family Plus Membership - \$170 (For up to 6 people)
- Family Membership - \$140 (for up to 4 people)

**Admissions and Target Audience:** Admission to the museum includes entry into the Museum, exploration of all exhibits, drop-in programs, and special activities. The admission fee for Ages 1 and up is \$17.95. The museum caters to children up to the age of 10.

**Exhibits and Programming:** Port Discovery features three floors of hands-on, interactive exhibits that encourage children to use their imaginations, ask questions, and explore how things work as they learn through play. Children learn to play together, experience real-world exhibits and situations and learn skills that help them in school and life. Some of the popular exhibits include: The SkyClimber, Adventure Expeditions, and the Port.

**Partnerships and Fundraising:** Several events are organized by the museum through donations, sponsorships and fundraisers, including our famously fun Play It Forward Gala and Hops & Vines Fundraiser and initiatives like Playing today, Leading Tomorrow capital campaign to contribute towards travelling exhibits, permanent exhibits, special events, family access events. The museum also offers corporate membership and has various tiers:

- Team builder -\$2500
- Problem Solvers - \$5000
- Creative Thinkers -\$10,000

## “College Town” Cases

### Discovery Space

**About:** Discovery Space is a science center based in State College, Pennsylvania. State College has a local population of approximately 42,224 and is the primary location of Pennsylvania State University (Penn State). Penn State has a student population of 46,780, making it considerably larger than Virginia Tech. Nevertheless, the State College region shares many similarities with the New River Valley. Among those similarities is a relatively nascent Children’s Museum. Discovery

space officially opened in 2011- three years prior to the Children's Museum of Blacksburg. Discovery Space primarily focuses on science, offering interactive exhibits and programming for all ages. The programs and exhibits are designed to "provide valuable informal science education, especially in the areas of Science, Technology, Engineering, and Math (STEM), in a fun learning environment."

**Membership:** Discovery space has approximately 1,200 members. The museum offers five membership options, each of which provide for at least yearly admission. More expensive membership packages offer additional benefits, such as passes for grandparents, caretakers, and family friends, discounts, etc. The five membership tiers are as follows:

- *Terrestrial:* Basic family (\$90/year)
- *Stellar:* Family (\$125/year)
- *Galactic:* Premium family one (\$250/year)
- *Quasar:* Premium family two (\$500/year)
- *Lunar:* Individual (\$65/year)

Corporate memberships are also available. These memberships range in price from \$500 to over \$5,000. These memberships have the same duration of family membership, but provide different benefits. More basic corporate membership might allow for one family visit per employee while more costly membership might provide for unlimited visits and acknowledgement of the partner firm on Discovery

**Admissions and Target Audience:** Nonmember visitors must pay \$7 per person to enter the museum, although children under the age of three may enter for free. The museum caters to children and young people up to the age of 14, although many of the museum's offerings are geared toward younger children. Finally, Discovery space had approximately 35,000 visitors in 2018.

**Exhibits and Programming:** Discovery Space has approximately 30 exhibits, most of which are made from wood and other simple materials. All exhibits are constructed by volunteers and typically demonstrate some sort of physics phenomena. Many exhibits have been made by engineering students at Penn State, which is advantageous for Discovery Space in that the University will pay for the materials. Exhibits typically see four years of frequent use, with a small number of visits still in use from the museum's opening in 2011. Most, if not all of the museum's exhibits are hands-on and require some sort of interaction with the museum user. The success of the museum's exhibits is evaluated anecdotally; staff members observe the museum with special attention to what exhibits are popular and which are not. Unpopular exhibits are either modified or rotated out of the museum's offerings.

**Partnerships and Fundraising:** As mentioned earlier, Discovery Space offers corporate memberships, some of which (higher dollar) contribute to the fundraising arm of the museum. Museum administration noted, however, that Discovery Space has never had more than four corporate sponsors at a time. The museum also receives some monetary support from the local government, although the dollar amount was suggested to be low. Discovery Space receives no direct financial contribution from Penn State, although the museum benefits from volunteer

based partnerships. Additionally, University faculty will occasionally write Discovery Space staff into grants, which will pay for some of the employee's time. The museum also harnesses grants for funding, however, does not rely on the typical set of museum funders. Museum administration noted that the presence of Penn State has allowed for a partnership with the American Association of University Women (AAUW), which has provided the museum with small annual grants.

## San Luis Obispo Children's Museum

**About:** The San Luis Obispo Children's Museum (SLOCM) is located in San Luis Obispo, California. San Luis Obispo is a city of about 46,000 residents and is most notably the home of California Polytechnic and State University (Cal Poly). Cal Poly has an enrollment of approximately 22,000 students, making it smaller than most public universities in California. The demographic landscape of the San Luis Obispo region and large university presence, however, make this area similar to both Blacksburg and State College. SLOCM began operations in 1990 and has seen tremendous organizational changes since then. The museum's first location was small but attracted over 40,000 guests annually. The museum closed in 2005 for new construction and reopened in 2009. Financial issues plagued the museum following its reopening. The museum closed briefly for restructuring and reclaimed its success following changes regarding financing, membership, and admissions. Now, the museum acts as a resource for informal and playful learning, offering three levels of exhibits covering broad topics relevant to early childhood development.

**Membership:** SLOCM has been successful in increasing its member base since its reopening in 2009. Membership has nearly tripled in the past nine years, rising from 240 member families in 2009 to 610 member families in 2018. The museum offers three membership packages, each of which provide for annual admission. SLOCM does not attach additional benefits to membership packages, notably because there is no retail offered on site. SLOCM's three levels of membership are as follows:

- *Play Date:* Membership for one adult and one child; \$75/year
- *You Can Play:* Membership for four people; \$95/year
- *Endless Play:* Membership for 6 people; \$175/year

SLOCM is also a member of the ACM Passport program, which allows for free entry for members of other ACM affiliated children's museums. Finally, the museum offers the *10 Play Pass*- 10 individual passes for \$70- as an alternative to membership for larger families.

**Admissions and Target Audience:** SLOCM has a standard ticket price of \$8 for adults and children. Museum administration noted that the standard ticket price only accounts for only two-thirds of the museum's cost per visit. Furthermore, SLOCM offers discounts for qualifying families. For instance, seniors above the age of 60 enter for \$5, military families enter for \$7, EBT cardholders enter for \$3, and children under the age of 2 enter for free. Museum administration mentioned that they were willing to take losses on admission to entice new visitors and encourage repeat visits and memberships. SLOCM attracts approximately 50,000 guests per year and caters to children aged between 1 and 10.

**Exhibits and Programming:** SLOCM distributes its exhibits thematically, over three floors. The first floor houses science and studio related exhibits where children can interact with science and physics phenomena. The second floor is reserved for the “little village” - a common attraction in children’s museums- where children can roleplay different jobs or positions with a pretend community. The museum’s third floor is a designated “early learners” space, which offers engaging exhibits for infants and toddlers. Exhibits are typically designed in-house or with help from faculty members and students from nearby Cal Poly. Similar to Discovery Space, the success of exhibits is measured anecdotally, with staff paying special attention to which offers are used more and less frequently. Museum administration also noted that exhibits should be attractive, engaging, and accessible, and, most importantly, should evoke a “wow factor” from children and parents.

**Partnerships and Fundraising:** SLOCM is unique among children’s museums in that it earned revenue accounts for 78% of total revenue. The remaining 22% of funding is provided through corporate and community sponsorship and individual donations. Again, similar to Discovery Space, SLOCM receives no direct monetary support from Cal Poly. Rather, grant funding is most notably provided through the Community Foundation of San Luis Obispo County and other smaller funders. The museum invests a considerable amount of money and staff resources on an annual fundraiser for member parents and other community members. The museum invests up to \$15,000 in event decorations, costumes, and other party items and typically receives \$80,000 in donations in return. Additionally, SLOCM donates the past year’s decorations to other children’s museums to host similar fundraising events.

## Sciencenter

**About:** Sciencenter is a children’s science museum located in Ithaca, New York. The museum grew from a volunteer-led science program offered at a local elementary school. The museum occupied several storefronts before moving into its permanent home in 1993. Since then, the museum has seen three phases of expansion, boasting 32,000 sq. ft. of contiguous space and an additional 8,000 sq. ft. building to support its traveling exhibits. Sciencenter is located in Tompkins County, New York, which also plays host to Cornell University. Similar to Cal Poly, Cornell has an enrollment of approximately 23,600 people. Sciencenter primarily focuses on science and physics phenomena and has emerged as a destination for families in the Northeast and Midwest.

**Membership:** Sciencenter has far more members compared to other “college town” cases. In 2017, for instance, the museum had approximately 2,295 members, marking a 306-member reduction from 2016 figures. Sciencenter offers four membership options, each of which provides for at least entry to the museum for a year. Sciencenter’s membership scheme is as follows:

- **Explorer (\$85):** Free admission to Sciencenter for one year. Additionally, the explorer pass grants purchasers free admission into all Association of Science Technology Centers worldwide. Purchasers also gain access to member-only events and receive various discounts on gifts, events, and birthday parties.

- Explorer Plus (\$110): This includes all explorer level benefits and free passes for two non-member guests with each visits as well as a pass for caregivers, etc.
- Explorer Premium (\$155): This also includes all explorer plus benefits and 50% off admissions at all Association of Children's Museum locations, transferrable admissions coupons, and 15% store purchases.
- Sustaining (\$250): this includes all explorer premium benefits and also pays for membership for a family in need.

**Admissions and Target Audience:** Sciencenter has a general admission price of \$8 for adults and children. Seniors over the age of 65 may enter the museum for \$7 and EBT cardholders can enter the museum for \$1 per person. Sciencenter hosted 109,866 guests in 2017, attracting guests from each of the fifty US States and 60 foreign countries. Of all visitors 47,601 were members; 43,652 were general admission guests; 15,433 were free visits provided through access programs; and 3,158 guests attended using first or third party promotional materials. Sciencenter has a broader target audience when compared to other children's museums, hosting exhibits for children up to 14. Museum exhibits are developed on the basis of children's development needs at certain ages. Sciencenter divides their audience into the following categories:

- Early Explorers (ages birth to 5): objectives for this age group include building curiosity, engaging parents and caregivers, and the introduction of basic scientific concepts such as cause-and-effect, gravity, and fluidity.
- Young Scientists (ages 5 to 11): objectives for this age group include building confidence and encouraging collaboration.
- Future Science Leaders (ages 11 to 14): objectives for this group include keeping young people engaged in science as well as encouraging creative thinking and meaningful communication.

**Exhibits and Programming:** Sciencenter has countless exhibits throughout its 32,000 sq. ft. facility. Exhibits are tailored to the museum's three target groups: early explorers, young scientists, and future science leaders. Additionally, exhibits are grouped into eight categories: astronomy (including the famous Carl Sagan Planet walk), early education, pet vet, live animals, ocean, outdoor, sustainability, and young scientist. These categories cover the broad areas of science. The museum also has nine travelling exhibits, which have been rented by 140 museums to date. Sciencenter also sells exhibits which they have rotated out of their offerings. The museum also has broad program offerings for children and families and groups and schools. Sciencenter currently offers preschool programs, interactive presentations, summer camps, teen leadership programs, field trips and group visits, and a portable planetarium.

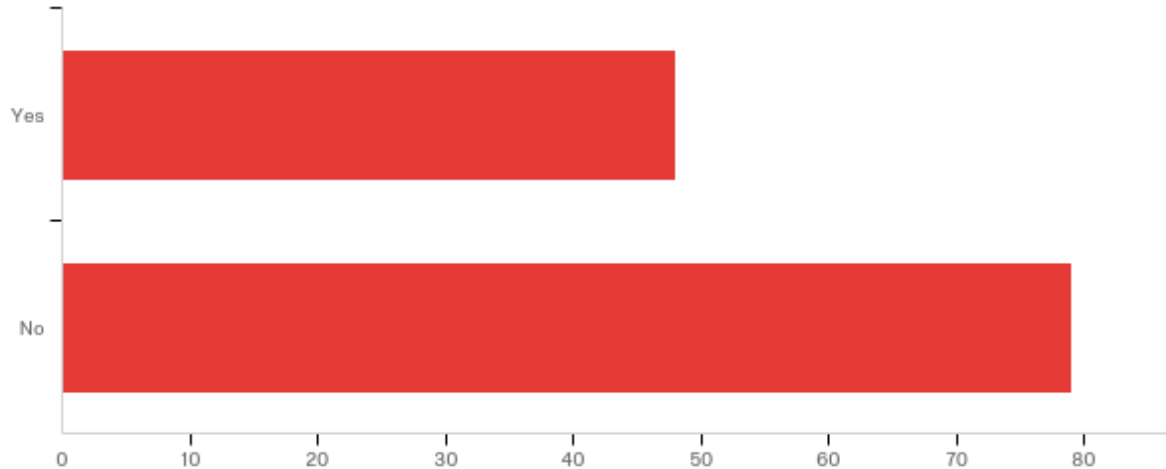
**Partnerships and Fundraising:** Fundraising is an important part of Sciencenter's operations. In 2017, donations and endowments accounted for 37% of Sciencenter's \$2,914,039 total revenue. Fundraising accounted for 8% of the museum's \$2,612,693 operating expenses. The Museum's endowment is its largest financial asset, with a balance of \$4,642,563 at the close of 2017. Additionally, the museum added \$678,003 to the endowment in 2017, with notable contributions coming from the Suzanne Spitz Science Education Fund (\$537,590) and the internal field trip fund (\$66,200). Other notable partners include federal agencies, such as the National Science



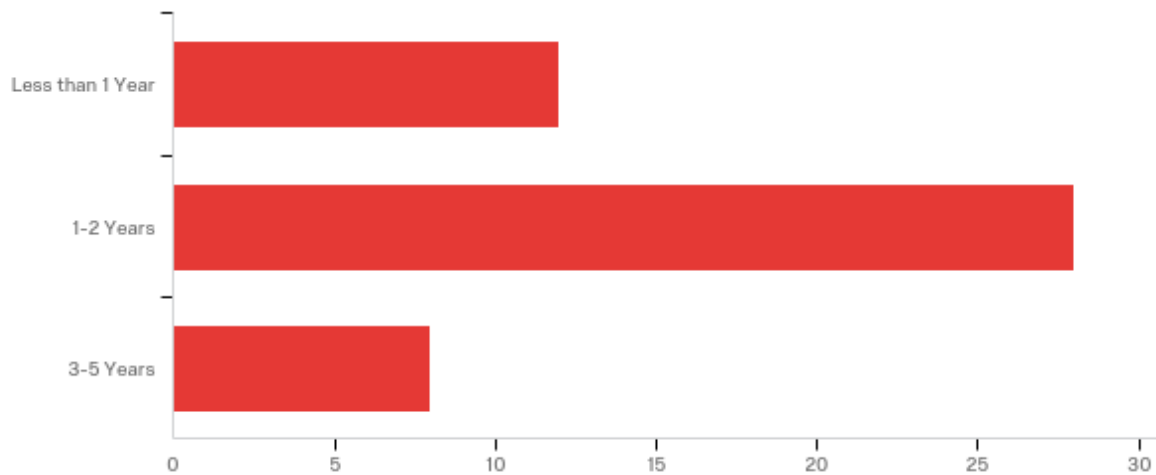
Foundation. Similar to the museums above, Sciencenter does not receive direct financial support from Cornell. Rather, Sciencenter partners with Cornell on an ad hoc basis or when museum expertise is required for research. The vast majority of museum-university partnership comes from grant opportunities funneled through Cornell's Office of Sponsored Projects. Cornell researchers will frequently be written into grants as investigators, which covers a portion of staff time.

## Appendix B: Survey Results

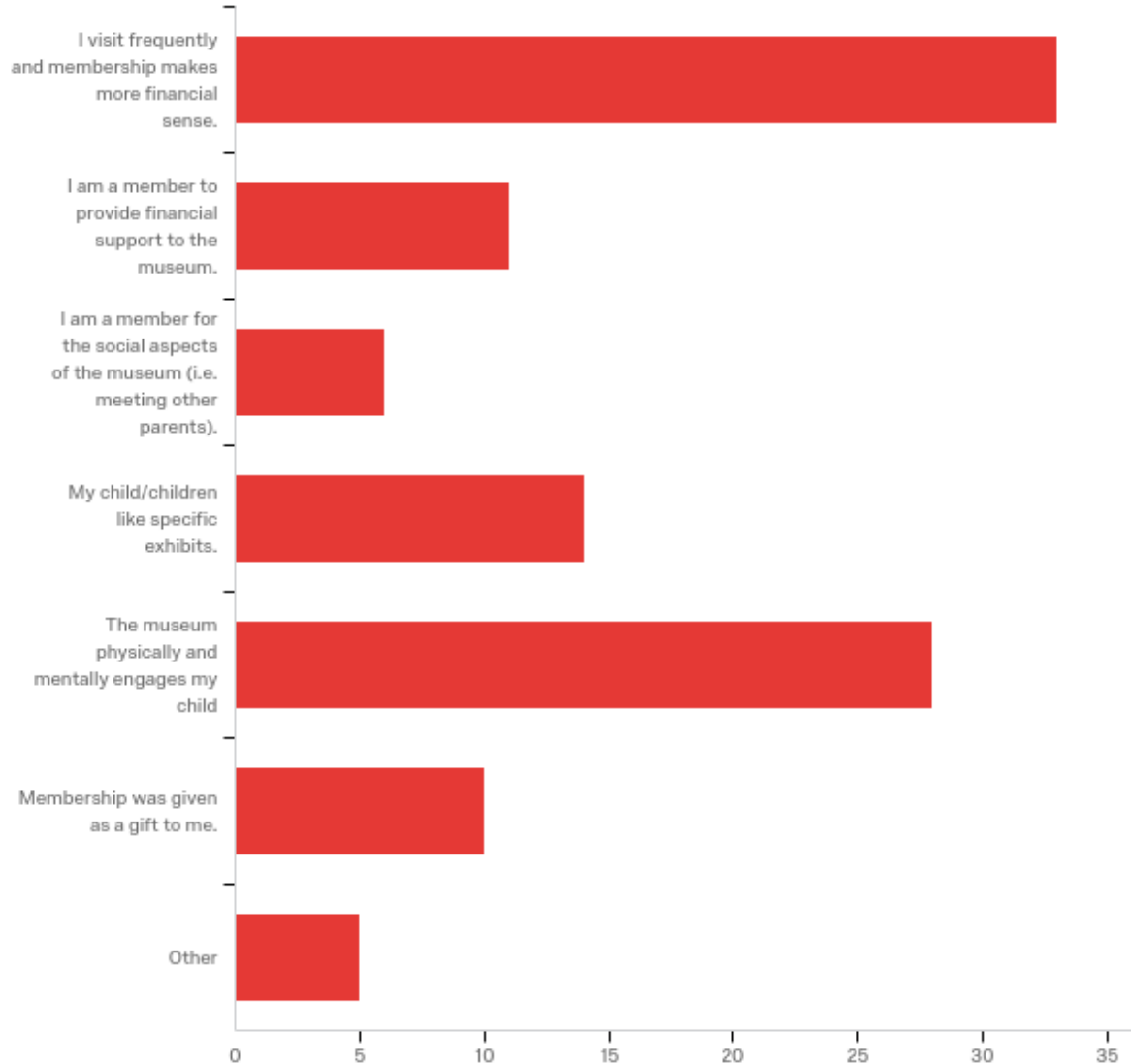
**Question 1:** Are you currently or have you been a member of the Children's Museum of Blacksburg?



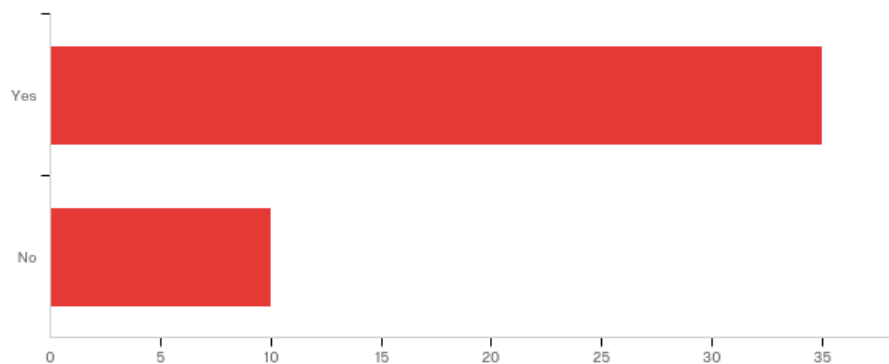
**Question 2:** How long have you been a member of the Children's Museum of Blacksburg?



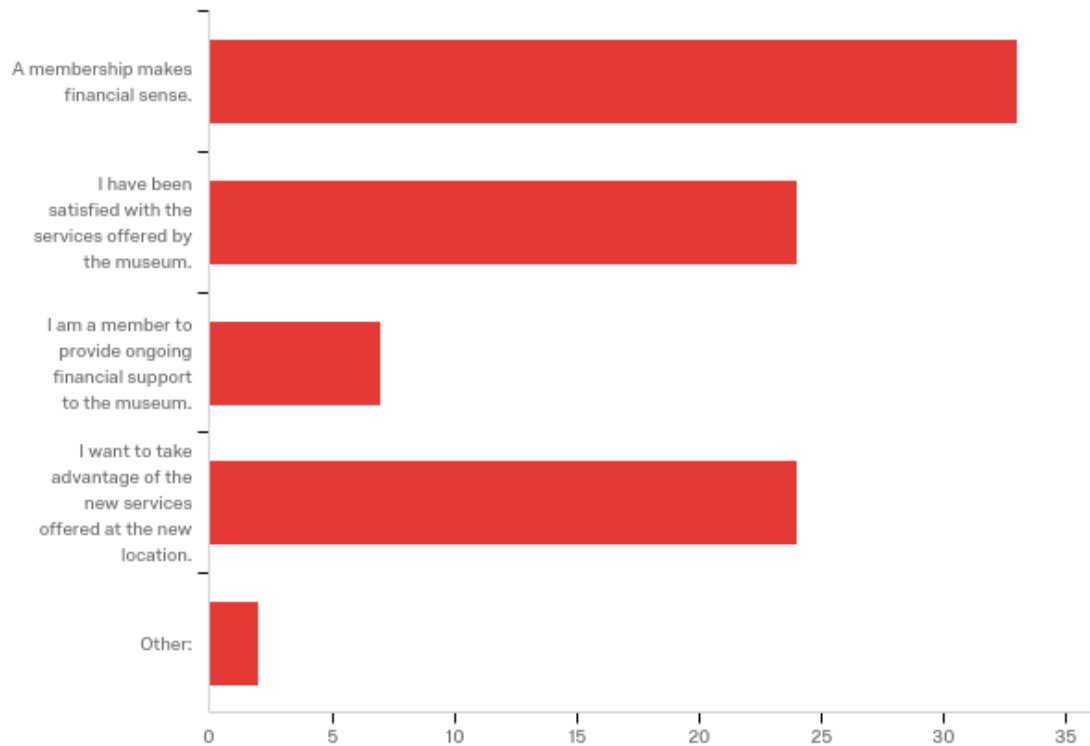
**Question 3:** Why are you a member of the museum? (Please select up to three (3) responses).



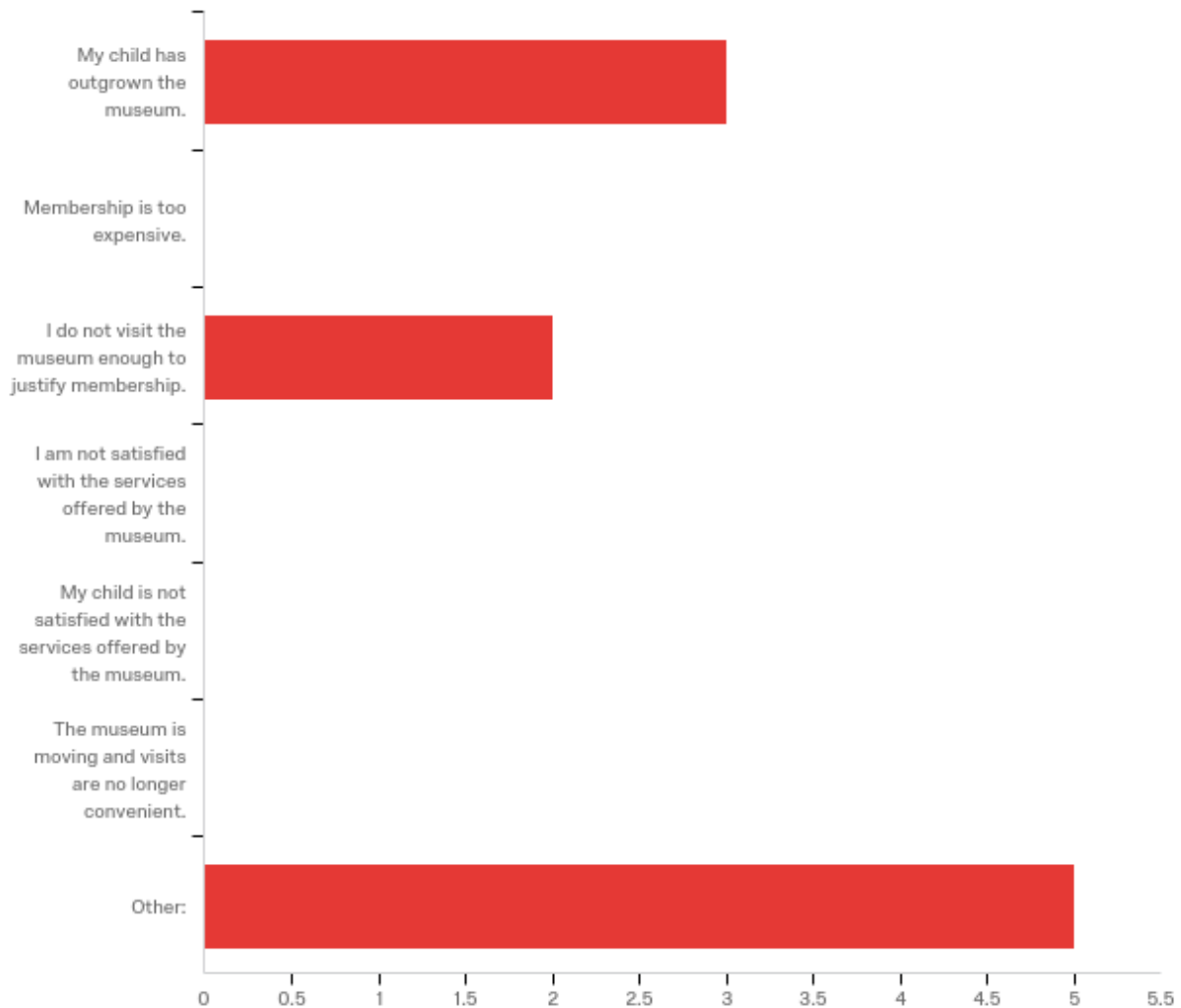
**Question 4:** Do you plan to renew your membership?



**Question 5:** Which of the following factors will influence your decision to renew your membership? (Choose all that apply.)

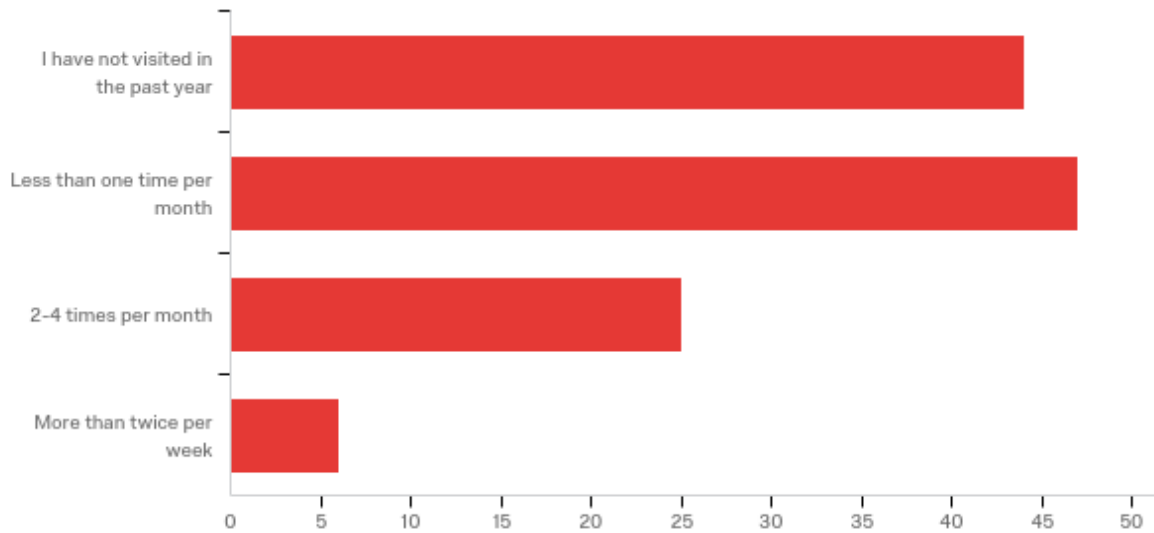


**Question 6:** Which of the following factors has influenced your decision to not renew your membership? (Please select up to three (3) responses.)

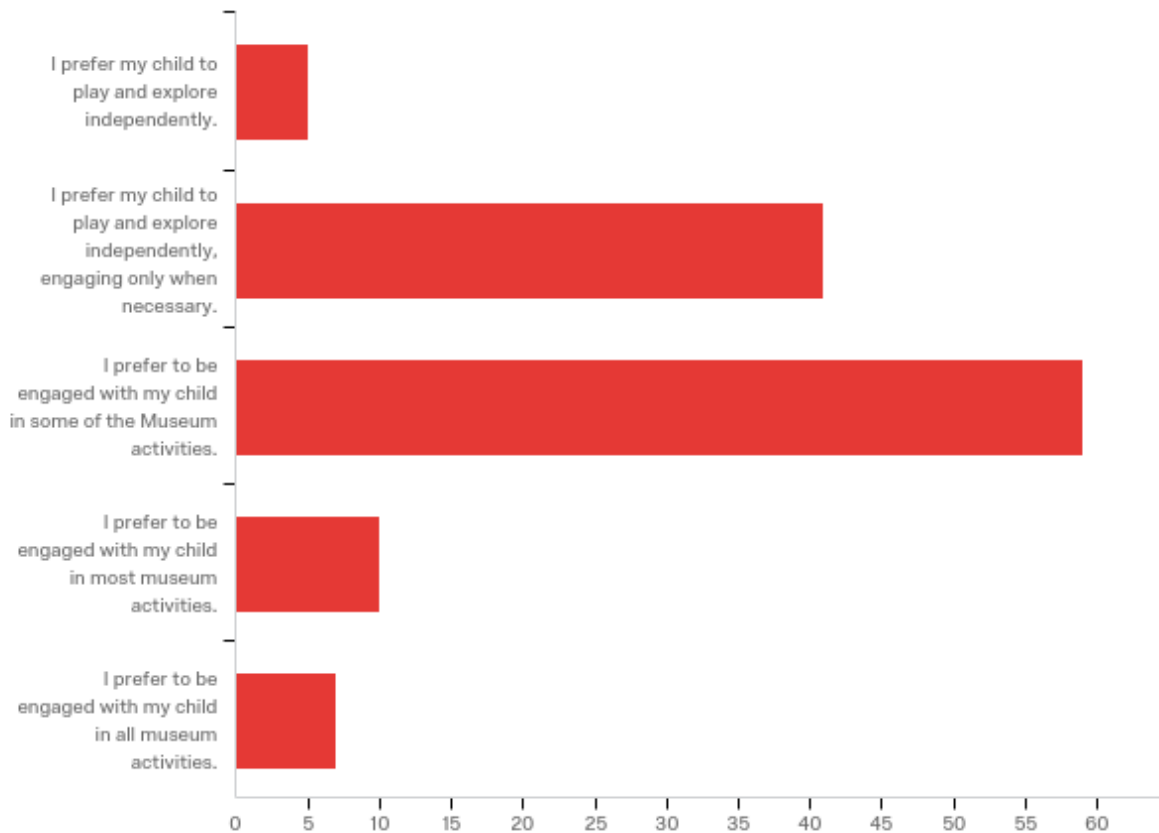


Note: Relocating out-of-region was a recurring justification for nonrenewal, according to survey text entry.

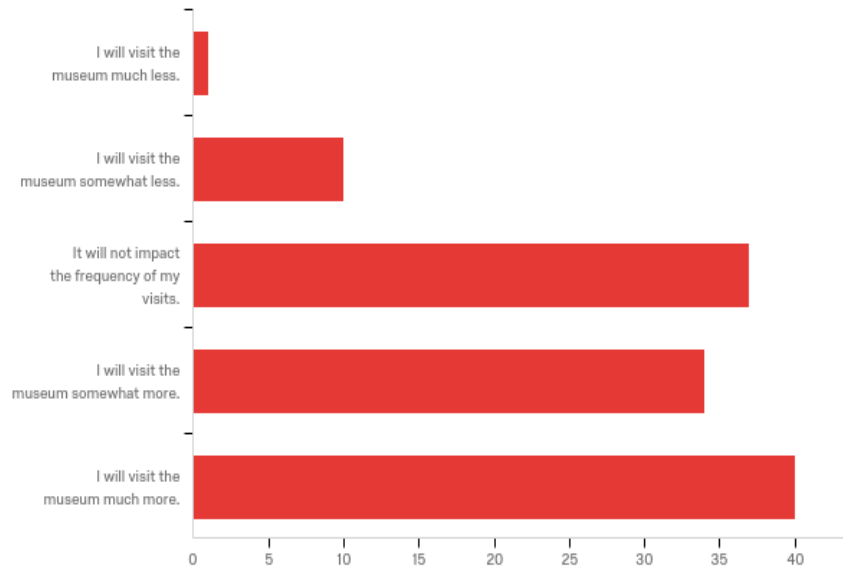
**Question 7:** How frequently did you visited the museum in the past year?



**Question 8:** What is your role as a parent/guardian/caretaker while visiting the museum?



**Question 9:** The children's museum is moving to a new location in Christiansburg. How will this affect the frequency of your visits?



**Question 10:** Please indicate your satisfaction with the following exhibits that were offered at the Children's Museum of Blacksburg?

|                                       | Not at all satisfied | # | Somewhat dissatisfied | #  | Neither satisfied nor dissatisfied | #  | Somewhat satisfied | #  | Very satisfied | #  |
|---------------------------------------|----------------------|---|-----------------------|----|------------------------------------|----|--------------------|----|----------------|----|
| Market                                | 0.0%                 | 0 | 3.0%                  | 3  | 18.8%                              | 19 | 27.7%              | 28 | 50.5%          | 51 |
| Theater                               | 3.0%                 | 3 | 7.0%                  | 7  | 32.0%                              | 32 | 34.0%              | 34 | 24.0%          | 24 |
| Hair Salon                            | 6.0%                 | 6 | 11.0%                 | 11 | 37.0%                              | 37 | 33.0%              | 33 | 13.0%          | 13 |
| Fire Station                          | 1.0%                 | 1 | 8.1%                  | 8  | 28.3%                              | 28 | 30.3%              | 30 | 32.3%          | 32 |
| Doctor's Office                       | 2.0%                 | 2 | 9.1%                  | 9  | 22.2%                              | 22 | 37.4%              | 37 | 29.3%          | 29 |
| Train Station                         | 0.0%                 | 0 | 2.0%                  | 2  | 13.9%                              | 14 | 27.7%              | 28 | 56.4%          | 57 |
| Geography                             | 3.1%                 | 3 | 4.1%                  | 4  | 41.8%                              | 41 | 32.7%              | 32 | 18.4%          | 18 |
| Light Tables                          | 2.0%                 | 2 | 2.0%                  | 2  | 22.0%                              | 22 | 33.0%              | 33 | 41.0%          | 41 |
| Art Area                              | 2.0%                 | 2 | 6.1%                  | 6  | 21.2%                              | 21 | 32.3%              | 32 | 38.4%          | 38 |
| Big Blue Blocks                       | 0.0%                 | 0 | 2.0%                  | 2  | 16.2%                              | 16 | 27.3%              | 27 | 54.6%          | 54 |
| Collaborative Play (e.g. Keva planks) | 2.0%                 | 2 | 3.0%                  | 3  | 26.0%                              | 26 | 34.0%              | 34 | 35.0%          | 35 |

**Question 11:** Please indicate your satisfaction with the following programs offered at the museum?

|                        | Not at all satisfied | # | Somewhat dissatisfied | # | Neither satisfied nor dissatisfied | #  | Somewhat satisfied | #  | Very satisfied | #  |
|------------------------|----------------------|---|-----------------------|---|------------------------------------|----|--------------------|----|----------------|----|
| Toddler Time           | 1.1%                 | 1 | 1.1%                  | 1 | 62.8%                              | 59 | 13.8%              | 13 | 21.3%          | 20 |
| Story Time with Joelle | 0.0%                 | 0 | 0.0%                  | 0 | 51.1%                              | 48 | 16.0%              | 15 | 33.0%          | 31 |
| STEAM Lab              | 0.0%                 | 0 | 2.1%                  | 2 | 56.3%                              | 54 | 20.8%              | 20 | 20.8%          | 20 |
| All Day Art            | 0.0%                 | 0 | 1.1%                  | 1 | 54.3%                              | 51 | 19.2%              | 18 | 25.5%          | 24 |
| STEM Sundays           | 0.0%                 | 0 | 2.1%                  | 2 | 69.2%                              | 65 | 8.5%               | 8  | 20.2%          | 19 |

**Question 12:** Children's museums offer a wide variety of exhibits and programs. Of the exhibit options below, which would you like to see offered at Wonder Universe? (Please select up to three (3) choices.

| Exhibit  | %   | Count |
|--|-----|-------|
| STEM Exhibits  | 20% | 65    |
| Exhibits that promote creativity                                     | 16% | 54    |
| Interactive exhibits involving a challenge/mission                   | 16% | 54    |
| Open-ended play and learning   | 16% | 54    |
| Environmental/natural resource exhibits (e.g. tide pools and plants) | 16% | 53    |
| Role playing exhibits  | 9%  | 30    |
| Cultural heritage exhibits   | 4%  | 14    |
| Multi-language exhibits  | 2%  | 8     |



**Question 13:** Of the program options listed below, which programs would you like to see offered at Wonder Universe? (Please select your top five (5) choices.)

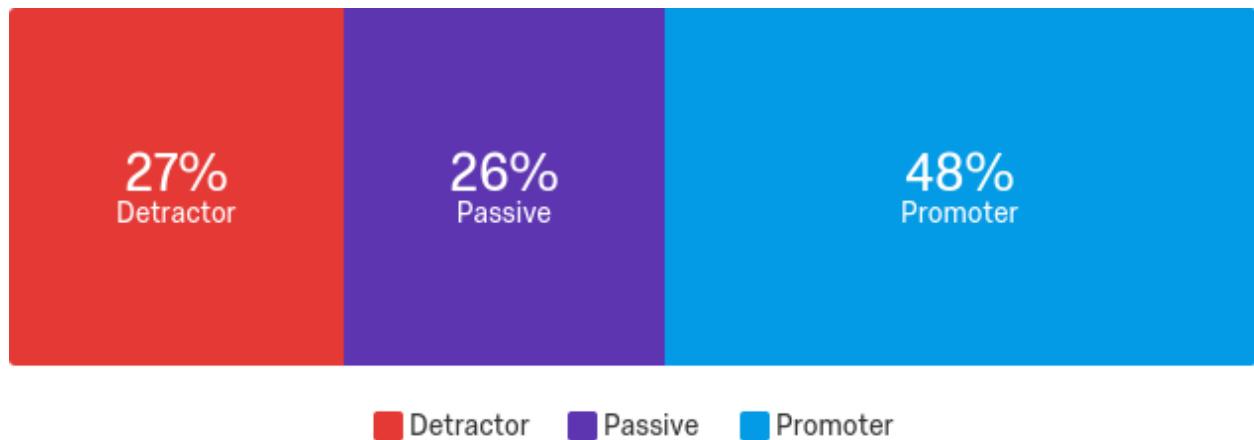
| Program   | %  | Count |
|---|----|-------|
| Art (i.e. ArtVentures, All Day Art)                               | 9% | 46    |
| Maker programs (i.e. sewing, designing, building, constructing)   | 8% | 42    |
| Parent's Night Out  | 8% | 39    |
| Toddler Time  | 8% | 39    |
| Science   | 7% | 35    |
| Technology (i.e. robotics, coding, etc.)                          | 7% | 35    |
| Music & Movement  | 7% | 35    |
| Ticketed programs for special occasions (i.e. Tea for Mommy & Me) | 6% | 33    |
| Storytime for preschoolers  | 6% | 31    |
| Drop-off programs for preschoolers                                | 5% | 24    |
| Summer camps  | 4% | 21    |
| Discovery workshops or classes (i.e. after school art classes)    | 4% | 20    |
| Infant & Me Playgroup   | 4% | 19    |
| STEAM Lab   | 4% | 19    |
| Drop-off programs for school age youth                            | 4% | 18    |
| JAM (Junior Appalachian Musicians)                                | 3% | 16    |
| Winter break camps  | 2% | 11    |
| Story time for school age youth                                   | 2% | 11    |
| Math  | 1% | 7     |
| Other:  | 1% | 6     |
| Chess Club (or similar)   | 1% | 3     |

Note: Respondents who chose “other” suggested to have specific programs for autistic children, programs that are not easily replicated at home and options for homeschooling children.

**Question 14:** How satisfied are you with your overall museum experience?

| Overall Satisfaction               | Members | %   | Non-Members | %   | Total | %   |
|------------------------------------|---------|-----|-------------|-----|-------|-----|
| Extremely dissatisfied             | 3       | 6%  | 4           | 5%  | 7     | 6%  |
| Extremely satisfied                | 16      | 33% | 13          | 16% | 29    | 23% |
| Neither satisfied nor dissatisfied | 2       | 4%  | 17          | 22% | 19    | 15% |
| Somewhat dissatisfied              | 3       | 6%  | 7           | 9%  | 10    | 8%  |
| Somewhat satisfied                 | 13      | 27% | 21          | 27% | 34    | 27% |
| Blank                              | 11      | 23% | 17          | 22% | 28    | 22% |

**Question 15:** How likely are you to recommend Wonder Universe to your friends or family?



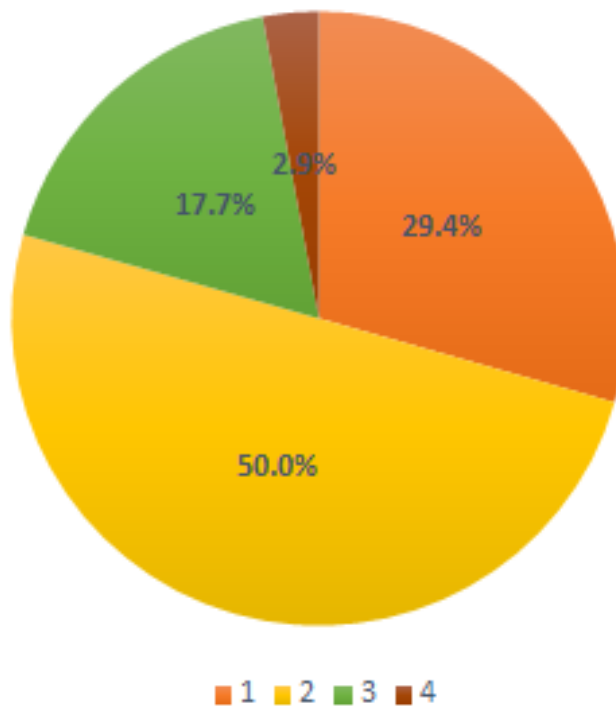
**Question 16:** Which town do you primarily visit for shopping, dining, entertainment, etc.?

- Christiansburg (68.2%)
- Blacksburg (24%)
- Radford (3.85%)
- Other: all the above, Dublin, Roanoke, Pulaski (3.85%).

**Question 17:** Please choose the option that best describes your family:

| Family Structure                | %      | #  |
|---------------------------------|--------|----|
| 1 parent, 1-2 children          | 2.88%  | 3  |
| 1 parent, 3-4 children          | 0.96%  | 1  |
| 1 parent, more than 5 children  | 0.00%  | 0  |
| 2 parents, 1-2 children         | 65.38% | 68 |
| 2 parents, 3-4 children         | 26.92% | 28 |
| 2 parents, more than 5 children | 0.00%  | 0  |
| Other                           | 3.85%  | 4  |

**Question 18:** Of the children that reside in your household, how many are under the age of 10?



**Question 19:** Please enter the ZIP code of your residence.

| Zip Code | Count | Zip Code | Count | Zip Code | Count |
|----------|-------|----------|-------|----------|-------|
| 24060    | 35    | 24016    | 1     | 24918    | 1     |
| 24073    | 32    | 24018    | 1     | 25971    | 1     |
| 24141    | 10    | 24072    | 1     | 25979    | 1     |
| 24084    | 4     | 24074    | 1     | 24150    | 1     |
| 24301    | 4     | 24091    | 1     | 24153    | 1     |
| 24124    | 2     | 24128    | 1     | 28604    | 1     |
| 24138    | 1     | 24134    | 1     |          |       |
| 24149    | 1     | 24312    | 1     |          |       |

**Question 20:** Please indicate whether you are employed by the following regional organizations, institutions, or employers. If your employer is not listed, please respond in the "other" category.

| Employer  | %      | Count |
|---|--------|-------|
| Virginia Tech and its associated research centers/institutes, including those located in the Corporate Research Center and elsewhere in the region. | 31.33% | 26    |
| Radford University and its associated research/institutes.  | 2.41%  | 2     |
| Other places of higher education. Please enter:   | 3.61%  | 3     |
| Local Schools, public or private.   | 15.66% | 13    |
| Large Manufacturers, including MOOG, Hubbell Lighting, Kollmorgen, Volvo.   | 1.20%  | 1     |
| Local Hospitals and Health Centers, including Lewisgale, Carilion, etc.   | 10.84% | 9     |
| Other   | 34.94% | 29    |

Note: Other Higher Education institutes include Concord University (2 persons) and VCOM. Other Occupations include Stay at home mothers (10), OZMO, Barber and Beauty, Self-employed, church, radford arsenal, Shelor Motor Mile, NRVCS, Waldorf Publishing, Financial institution, Modea.

**Question 21:** Please enter the ZIP code of your workplace.

| Zip Code | Count | Zip Code | Count |
|----------|-------|----------|-------|
| 24060    | 31    | 24128    | 1     |
| 24073    | 16    | 24138    | 1     |
| 24061    | 11    | 24149    | 1     |
| 24301    | 4     | 24150    | 1     |
| 24091    | 3     | 24151    | 1     |
| 24141    | 2     | 24951    | 1     |
| 24142    | 2     | 25971    | 1     |
| 24012    | 2     | 42701    | 1     |
| 24018    | 1     | 24124    | 1     |

**Question 21:** What is your annual household income? Note, all survey responses are anonymous.

| Annual Income            | %      | Count |
|--------------------------|--------|-------|
| Less than \$10,000       | 1.94%  | 2     |
| \$10,000-\$14,999        | 0.97%  | 1     |
| \$15,000-\$24,999        | 4.85%  | 5     |
| \$25,000-\$34,999        | 6.80%  | 7     |
| \$35,000-\$49,999        | 7.77%  | 8     |
| \$50,000-\$74,999        | 18.45% | 19    |
| \$75,000-\$99,999        | 20.39% | 21    |
| \$100,000-\$149,999      | 19.42% | 20    |
| \$150,000-\$199,999      | 3.88%  | 4     |
| \$90,000 - \$99,999      | 0.00%  | 0     |
| \$200,000 or more        | 3.88%  | 4     |
| I prefer not to respond. | 11.65% | 12    |

**Question 22:** Please briefly share why the museum is important to you and your family.

- Indoor activities with focus
- I want my children to have a place to go to learn while playing
- It is a safe, indoor, welcoming place for children with special needs.
- It's a place that my 5 year old with autism loves to go and can be himself. He absolutely loved the train station and tables
- our children do not attend daycare/preschool and this is a good way to socialize and expose them to different activities
- The museum was a place we played weekly, often multiple times a week, as a way to get out of the house and engage/have new experiences. The museum's closure has been a huge loss to our family. I greatly wish the old museum stayed open in this long interim period. We cannot wait for Wonder Universe and will be there all the time!
- The NRV needs more interactive options for family to immerse everyone in educational activities that are age appropriate fun and safe
- my son loves to play

- I love having an indoor space where my child can enjoy and interact outside of the house
- My 2 year old twins love the opportunity to explore and learn and the museum was providing that.
- Our son has a speech delay, having the opportunity to interact with children his age greatly helps his speech
- Kids can run and play safely inside and I can socialize.
- One of the only places in the area to take kids for indoor exploring
- Love having something to do with my son.
- My son loves it
- It is a fun, educational, safe place for my children to play and interact with other children. It gives them a clean friendly change of scenery, and new faces to play and learn and communicate with. My children always enjoy the museum and can't wait for the reopen.
- It allows a safe place for my children to play, interact with other children, and learn.
- Learning and playing together
- Positive experiences for children
- Haven't been but 3 year olds really wants to go for role play and co op play time
- My kids loves it
- It provides an educational and fun environment
- There are few local indoor options for kids and most of them are not open most of the time.
- Family resources are limited in this fairly rural area
- Options for indoor things to do
- My oldest has sensory and autism, therefore the exhibits and activities help him learn and explore.
- Kids love it and learn while having fun!
- A place to explore learning
- It is a fun place for my kids to go and play and explore. They learn how things work while having fun!
- Indoor entertainment for children
- Fun space especially in winter to play and socialize
- Hands-on learning for my kids
- Child friendly activities that involve exploration and learning
- An indoor place to explore and learn- and burn some energy!
- We just really need to get out of the house and explore.
- Early childhood education is very important to me and there's no places like this around me.
- It gives my daughter a chance to have independent play in a safe space. I like that she can also play with others!
- Grandson loves it!
- Allows a safe place for my kids to explore and play especially on rainy days.
- Things to do and learn with kids
- I want a place of learning for my children. Gives more options for this town

- It's important to allow my toddler to be creative, socialize, and experience play in an educating environment with her surrounding community.
- It is a place where the kids can play, but also a good place for the parents to take a break and meet other parents.
- It's a fun and stimulating environment to give our kids a place to explore and learn while getting us out of the house.
- I want my grandchildren to be able to play independently and this fosters their imaginations.
- It's only important because it is the only indoor play place for children. If there were other options it wouldn't be important. So it's important by default.
- We need culture and fun for children!
- Great place for kids to grow intellectually and creatively, along with good place to visit in winter.
- My son has autism. The museum has special needs night and my son and his twin plays to get some exposure to different sensory
- Allows the kids a place to play in the winter
- We always go there to relax, I feel safe, I know my friends will always be there!
- We have two children under 3 years old and are interested in creative indoor experiences for them
- I have never been to the museum, I never knew it existed. I am anxious to get my kids out more as we have nothing for children in Giles County.
- Something to do with the family.
- Affordable activity to provide multicultural experiences.
- Safe play time
- A place to take my children to play when the weather is bad or we are bored at home. A place where they can interact with peers.
- Fun and educational
- Education activities for our child; place to get together with other families
- Engagement for my child.
- Gives me an indoor place to take my kids to play when the weather outside is poor
- We just relocated to the area and I am thrilled to have a place like this to take my son.
- A place for our children to have fun and learn
- It's fun and there is a lot of creative freedom
- My kids love it!
- Montessori based play is important to me. I like coming to the museum for playdates for toddlers.
- My children love visiting!
- A place for community learning and fun
- An engaging place to play
- a wonderful place for children to role play, do creative activities in a safe and encouraging environment, learn through play
- To have numerous opportunities to broaden our families knowledge base.
- My kids love it.
- It was a great place to take my grandson



- Fun place to visit during summer
- Indoor independent play areas are hard to come by around here
- Exploring
- A place for my child to play and explore
- We need engaging indoor activities for children in our area
- Provides a place for kids to freely play in a new environment
- Family activities close to home.
- Fun activity for the whole family to enjoy

**Question 23:** In your opinion, what value does the museum bring to:

In your opinion, what value does the museum bring to: Families - Text

- Teaching your kids different aspects of life
- It helps to fill the gap of affordable indoor play spaces.
- I enjoyed the size of the old museum because I could see all of my kids at once. It was such an amazing place to go daily with a large group of kids! Fun for all!!!
- Education, promoting family bonding, social skills, Individual and group play
- Bonding time.
- Fun activities especially in the colder months
- A place to be creative and meet others
- Quality time
- A fun learning and bonding experience
- Somewhere to go to play and socialize indoors.
- Educational and recreational opportunities
- Learning, fun outlet
- Education
- Time together.
- Family time
- Safe place to play
- New learning opportunities
- Playing together, building attachment, making happy memories
- Meeting other families
- Educational family bonding where everyone can learn something new
- Quality time together
- A great place for children to grow
- Safe place for creative interactions and exploration, and making friends with other kids and parents
- Learning together; educated adults and children
- Again, the only place for parents to take their children on hot, rainy, or snowy days. If there were other options, the museum might not be used as much
- Place to interact with other and help children learn with hands on objects
- Fun and creativity
- Safety, fun, clean, vibrant
- Something to do together

In your opinion, what value does the museum bring to: Broader Regional Community- Text

- People can get together and play in a safe neutral space and get to know others in the community
- Shows a community values children and their importance to the future
- Community gathering and fun
- Chance to connect with different people/cultures
- More foot traffic for the mall
- education about the importance of early childhood
- Stimulates young minds and bodies, promotes community
- Safe neutral space for socializing with community members
- Early childhood development and its future impact in the community
- Economic impact of WU visitors on the mall and surrounding shopping area.
- Exposure and interaction with people from diverse cultural backgrounds.