

Karl Stirner Arts Trail (KSAT) Musical Playground

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Lafayette College

December 2015

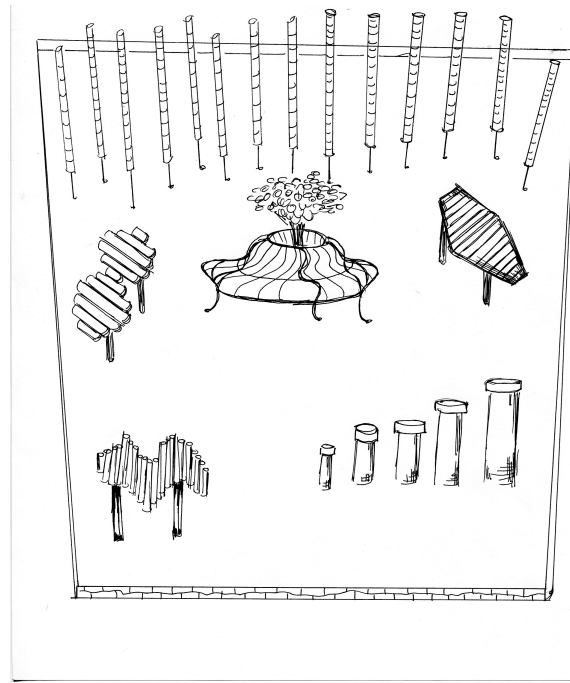


Figure 1: Proposed plan of the musical playground.
Picture drawn by author.

The Karl Stirner Arts Trail (KSAT) is located on the south side of the Bushkill River in Easton, Pennsylvania between 3rd and 13th Street. The trail is paved and lined with trees and vegetation on both sides. Sculptures and artistic elements are featured along the 2.5 mile trail, as well as a dog park. Our task is to design a feasibility study of implementing a musical playground alongside the KSAT, analyzing the social, policy, technical and economic aspects of the project. The feasibility study will be used in the spring of 2016 when the Engineering Studies 480 Sustainable Solutions course will actually construct the proposed design. We are excited by the prospect of positively contributing to the community and making Easton an even better place to live.

INTRODUCTION



Figure 1: Welcome to the City of Easton sign. Photo from ughivac.com

The Karl Stirner Arts Trail (KSAT), named after sculptor [Karl Stirner](#), aims to provide not only a safe place for exercise, but also an environment that promotes and encourages art in its many forms. Towards that goal, the KSAT Board installs new sculptures or artwork along the trail periodically. German-born and from Philadelphia, Karl Stirner began his art career at age 23. He served as an industrial designer in WWII before holding teaching positions at Temple University and Moore and Swarthmore Colleges. In 1983 he moved to Easton and has since been a prominent figure in promoting art within the community. In 2011, to acknowledge his years of mentorship, the trail was renamed in his honor. Today the trail is regularly used by residents of Easton and the students of Lafayette College alike. Lafayette College is a private four-year college which sits atop the hill around which a section of the trail runs. A picture of the current trail is featured below (Figure 2), indicated by the red dotted line. The paw indicates a dog park situated along the trail.



Figure 2: Map of the Karl Stirner Arts Trail. Photo from karlstirner.com

The goal of the Karl Stirner Arts Trail is two fold. Its first goal, as mentioned above, is to promote art in its many forms. Currently, the trail is home to many sculptures placed along the edges of the trail and paintings on its walls. While the visual artistic aspect of the trail is apparent, there is no mode for auditory forms of expression. The second goal of the trail is to provide a civic space for residents of Easton to sit and enjoy together. In order to meld these two goals, as well as provide a mode for auditory forms of expression, the KSAT Board desires to implement a musical playground along the trail.



Figure 3: Arch along the Karl Stirner Arts Trail. Photo from lehighvalleyppa.tumblr.com

For more information about the Karl Stirner Arts Trail, please visit the [KSAT homepage](#).

Looking for innovative ways to implement a musical playground along the KSAT to further promote the many forms of art and inspire the community, the KSAT Board enlisted the assistance of a team of students from Lafayette College to create a feasibility study for the project. This team, composed of four seniors from the [Engineering Studies Department](#), used their training in business and engineering to assess the options of equipment to install. The purpose of the feasibility study is to recommend certain instruments to be installed at the musical playground that will be socially, politically, economically, and technically feasible, discussions of which can be found on their respected pages. In the spring of 2016, Lafayette College's [Engineering Studies 480: Sustainable Solutions](#) class will use the feasibility study to purchase and install the musical instruments.



Figure 4: The Contrabass Chimes from Freenotes Harmony Park, one of the instruments recommended for the KSAT musical playground. Photo from www.strictlyforkidsstore.com

Instrumental in the feasibility study is Jim Toia, the head of the KSAT Board and faculty member in the [Art Department](#) at Lafayette College. Jim Toia outlined the goals of the musical playground, which consist of civic space and maintaining the art theme. The idea of the playground was born out of the desire to create more civic space for Easton residents. Though the KSAT is a great location for walking, running, and biking, there is no community location along the trail, besides the dog park, where once can stop and sit, chatting and appreciating the art with others. The playground would provide a space to do so. Instead of simply installing a pavilion, slides, and swings, however, the KSAT Board decided to only install equipment that promotes the art theme of the trail. This means, that when choosing instruments, the focus needs to be aesthetics. The KSAT Board wants to create an aesthetically pleasing space for the residents of Easton to gather, giving art precedence over functionality. The ideal arrangement will consist of instruments that not

only please the eye, but also the ear, and is to be located on the plot of land directly next to the dog park, shown below.



Figure 5: Installation site of the musical playground. Photo taken by author.

Unlike many construction projects, selecting and installing the musical equipment has few limitations besides the importance of a civic space and eye appeal. One technical challenge, however, lies in the amount of space allotted, which is a single area of 1,000 square feet. Given that space, a balance had to be found between the size of the instruments and number installed. Each piece of equipment requires adequate open space around it to ensure smooth movement between and around the structures, yet enough instruments had to be purchased to cater to groups using the musical playground simultaneously. On the economic side, a generous budget is available for the the purchasing and installing of the equipment as the [Easton Parks Department](#) is planning to partly finance this project with monies left over from another project. They were willing to match whatever amount can be collected from other donors and organizations up to a total budget of \$60,000 to \$70,000. This allotment will need to cover not only the purchasing and installation of the instruments, however, but also any brush clearing, ground leveling, and surface covering. Fortunately, the class scheduled to install the musical playground in the spring can perform most, if not all, of the manual labor, allowing the budgeted monies to be spent primarily on equipment and supplies, which in addition to the instruments, will include garden stones and cement.

SOCIAL CONTEXT



Figure 6: Youth from the Boys & Girls Club of Easton paint on the Young Masters Wall along the Karl Stirner Arts Trail in Easton. Photo and caption from <http://photos.lehighvalleylive.com/express-times>

This page goes in-depth into the social contexts involved in creating a musical playground on the Karl Stirner Arts Trail. These social contexts are important in creating an engineering project that takes the community into account. With the following aspects of implementing a musical playground on the Karl Stirner Arts trail in mind, we can begin to see this project in more than just an engineering or technical sense. Keeping in mind the historical context, the community that the project is planning to serve, and the potential social benefits of the project allows us to frame the project in a truly community oriented way.

Historical Context

The historical context through which the Karl Stirner Arts Trail came to be what it is today can help us understand the reasons for putting a musical playground along the trail in the first place. As our engineering curriculum has taught us, it is important to understand the history of a community before an engineer seeks to implement change there. The Karl Stirner Arts Trail was named after Karl Stirner, a sculptor who sought to use the trail as one of many means to usher aspiring artists to Easton. An additional purpose aimed for the trail to be a pathway connecting various parts of Easton and by allowing residents to walk, bike, and run in a scenic and safe place. The trail also contains art installations throughout and a dog park, Easton's first, with a fenced-in area for canine play. The trail is meant to be used by Easton and Lafayette residents alike.

Dual Community

The Karl Stirner Arts Trail is a beautiful trail along which the residents of Easton may walk, run, or bike. Due to the location of the trail, it must cater to two different groups of people, the families of Easton and the students of Lafayette College. A musical playground along the KSAT would serve families by providing a place for children to find healthy entertainment

and an outlet for their energy while also offering the benefits of a unique playtime experience that only a musical playground offers. We trust the families will enjoy and benefit from the musical playground as the initiative came from the KSAT Board, a representative for those families. The second group using this trail are the students of Lafayette College. While the students may get less personal use from a playground than young children, a community space in this area could increase the community feel of the area, which Lafayette students enjoy while on the trail. This could in turn help Lafayette students feel more at home on the campus and the greater Easton community. Furthermore, as this project is showcasing, the design and implementation of the trail provides a unique educational opportunity benefiting to the Lafayette students. While speaking with our peers, we have sensed that this playground is something that the college community would also like to see. In these ways the musical playground intends to be a place for the communities in Easton.



Figure 7: Lafayette College. Photo from <http://facilitiesplanning.lafayette.edu>



Figure 8: Easton Center Circle. Photo from <http://www.kitchenadviser.net>

In the News

Over the past couple months there have been a number of new stories to document the importance of the KSAT to the Easton community. [One article](#), from August of 2015, speaks about the excitement surrounding a competition to see which pieces of art would be installed along the trail. As part of this competition, 25 artists submitted 23 proposals and the local community was given the chance to vote for which ones they desired incorporated into the trail.

[Another article](#), from September of 2015, advertises the 2nd annual Karl Stirner Arts Trail auction, which was held in October. The auction raised money for the trail, successfully too, as last year's auction raised a total of \$40,000. The proceeds go towards the acquisition, installation, and maintenance of works along the trail. As a result of last year's auction, three new installations were placed along the trail.

Lastly, a [third article](#) announces a movie night on the trail. The article informs the public of the pertinent details of the event, highlighting that it is truly a community event as local restaurant Porter's Pub sold beverages and Easton FOP Lodge 16 sold popcorn. The recent trend in news coverage about the trail indicates that it is an area of growing interest for Easton residents. This indicates a promising future for new installments, such as a musical playground, along the trail.

Civic Space

The Karl Stirner Arts Trail is meant to provide a civic space for both the residents Lafayette College and the larger Easton community. Currently there is no space to congregate and mingle along the trail except benches placed throughout the trail and the dog park. The trail is in desperate need, however, of a space for people to be able to gather and enjoy the trail together. Currently the [Friends of the Karl Stirner Arts Trail](#), a group that organizes events on the trail such as movie nights, hosts clean up days and temporary art exhibits.

Monica Seligman, the president of the Friends of KSAT group, is the contact. This group can be pivotal in holding informational events for this project when it gets off the ground.

Building a musical playground along the KSAT creates a more enhanced civic space than some other gathering spaces because the presence of music has been shown to decrease childhood bullying, which is a common problem on playgrounds where bullies are given free reign and a variety of victims. This is a significant problem as bullying has been shown to have serious and long lasting physical and psychological effects on the bullies and victims alike. Physical effects include headaches, stomachaches, and dizziness, while psychological effects include depression and anti-social behavior. In order to decrease bullying, and therefore these negative effects, the creation of a “safe (school) climate that promotes positive interactions among children” is highly desirable (Ziv & Dolev, 2013). Evidence shows that a positive playground atmosphere, such as that created by background music, reduces the likelihood of bullying. One study showed a significant reduction in direct and indirect bullying on days when background music was played during recess. Students also reported lower levels of anxiety and higher levels of enjoyment on days with music, as shown in the table below.

Questionnaire	Week 1-Baseline		Week 2-Music		Week 3-No Music	
	M	(SD)	M	(SD)	M	(SD)
Direct bullying	1.68	(1.41)	.29	(.49)	1.27	(.94)
Indirect bullying	.42	(.45)	.08	(.17)	.32	(.35)
Total bullying	2.12	(1.73)	.38	(.57)	1.39	(.98)
Recess enjoyment	.95	(.6)	1.65	(.35)	.77	(.6)
Arousal scores	5.95	(1.86)	3.61	(.81)	5.97	(1.84)

Figure 9: Direct and Indirect Bullying, Enjoyment of Recess, and Arousal Level Scores (Ziv & Dolev, 2013).

According to the study, music has the ability to calm children and reduce anxiety (Ziv & Dolev, 2013). Therefore, creating a musical playground will serve the social purpose of calming children and reducing childhood bullying, which has the potential to be a real danger to everyone involved.

Educational Benefit

A musical playground has the potential to impact the educational capabilities of children because music has been shown to enhance cognitive abilities. This was first seen through the “Mozart effect,” which reported superior spatial abilities for those who listened to Mozart music. Music listening and performing can lead to short and long-term cognitive benefits (Schellenberg, 2005).

Brain scanning instruments have been able to show that certain areas of the brain become stimulated based on an individual’s outward stimuli. While reading and doing math, or other brain inducing activities, certain areas of the brain have shown to become stimulated. Multiple areas of the brain become stimulated when subjects listen to music as their brains

work quickly to process sound, take it apart to identify melody and rhythm, and put it all together again. Playing music stimulates the brain even further. In particular, while playing music, the brain's auditory, visual and motor areas of the brain are stimulated, as shown in Figure 10. Practice makes these areas even stronger, and can be used to increase brain function during other activities as well. The left hemisphere of the brain deals with mathematical and linguistic proficiency while the right hemisphere of the brain deals with creativity. As shown in Figure 11, when playing music the left and right hemispheres of the brain are simultaneously stimulated, strengthening the bridge between these two hemispheres, and therefore better allowing for the quick transfer of information between them. Consequently, people who play instruments are shown to have better problem solving abilities and better memories (Collins).

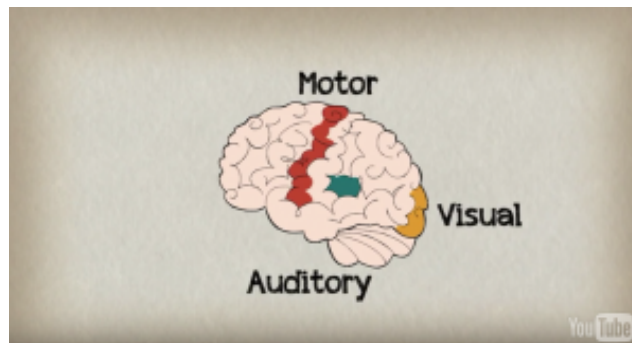


Figure 10: Stimulated Areas of the Brain Photo from <http://ed.ted.com/lessons/how-playing-an-instrument-benefits-your-brain-anita-collins>

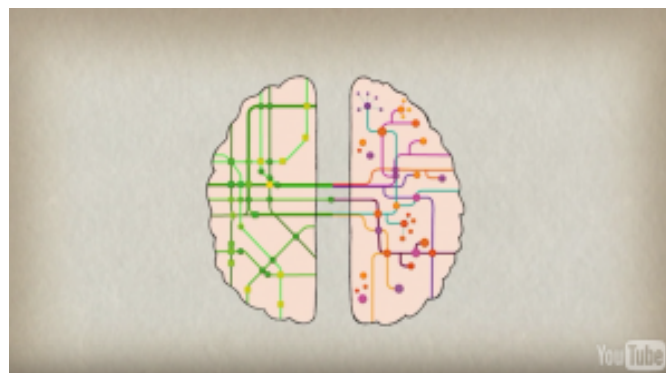


Figure 11: Connection of Right and Left Hemispheres of the Brain. Photo from <http://ed.ted.com/lessons/how-playing-an-instrument-benefits-your-brain-anita-collins>

Therefore, building a musical playground along the KSAT has the potential to provide various educational benefits to the children of Easton. At this musical playground children will be given the opportunity to both listen to and play music, stimulating their brains as described above. Musical playgrounds can also foster a love for music that could lead to a desire in children to learn an instrument or stay connected to music as they grow older.

Therapeutic Benefit

Music Therapy is a well-established discipline that uses music to achieve some treatment in people with learning disorders. Research shows that music can increase the ability of an autism patient to learn and interact with their surroundings (American Music Therapy Association, 2010). The full list of benefits, as outlined by the American Music Therapy Association (2010), are provided below:

- Increased Attention
- Decreased self-stimulation
- Improved cognitive functioning
- Increased socialization
- Successful and safe self expression
- Improved behavior
- Enhanced auditory processing
- Decreased agitation
- Improved verbal skills
- Enhanced sensory-motor skills

The American Music Therapy Association (2010) cites many sources of music therapy research, each providing support to the listed benefits of music therapy for people with autism. In Whipple's research, for example, he notes an overall positive direction in the correlation of music therapy and autism. By reviewing other research performed in the past thirty years, which included different music uses (background, story set to music, etc.), music selections (song choice) and music presentations (live/recorded), Whipple was able to accurately see this positive trend fairly consistently (2004). The benefits of music therapy are not constricted to certain age groups, music used, or other variables. Music, therefore, provides therapy for people with autism through many forms including, potentially, musical playgrounds.

Musical playgrounds also have the social benefit of providing a means of therapy for children with Sensory Processing Disorder (SPD). Many of the elements of a musical playground are able to be therapeutic for children with SPD because they provide children with a source of simultaneous motion, visual and auditory inputs. According to the SPD Foundation, the stimulation of these senses can produce a calm state in children with SPD (Miller & Schoen).

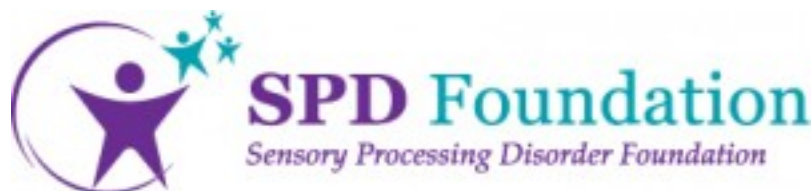


Figure 12: SPD Foundation Logo. Photo from <http://www.spdfoundation.net>

In particular, the SPD Foundation provided an analysis of the therapeutic benefit of the Wonderworx equipment. This analysis is, however, appropriate to many other musical instruments as well. According to this analysis, the musical equipment provides

therapeutic benefits in many forms, including the opportunity to produce a “calm state of arousal” in a child through the following senses:

1. Motion and balance
2. Sound, percussion and pitch
3. Sight, speed and timing

According to the SPD foundation, vestibular stimulation “provides information about spatial orientation, balance and the ability to maintain a stable visual image with movement” (SPD Foundation). Such stimulation, as triggered by the music, is able to affect the child’s state of arousal and increase the attention and alertness of the child.

The musical equipment also serve to provide opportunities for fun, where children can “engage in a wide range of strategic, developmentally appropriate play” (SPD Foundation). The equipment provides opportunity for games that allow for child development and the musical equipment provides opportunities for social interaction as children are meant to play facing one another in order to better communicate while playing. Such interaction can increase “vocalization, spontaneous verbal communication and non-verbal interactions” in child with SPD (SPD Foundation).

Providing musical instruments along the Karl Stirner Arts Trail can have therapeutic benefits for children with both Autism and SPD, thus providing a strong social incentive to bring this project to fruition.

Conclusion

A musical playground located on the KSAT would serve the dual communities of Easton families and Lafayette College students alike by creating a civic space that can foster community engagement. The educational and therapeutic benefits to the children who use the musical playground provide further evidence of the benefits of the addition.

POLICY ANALYSIS

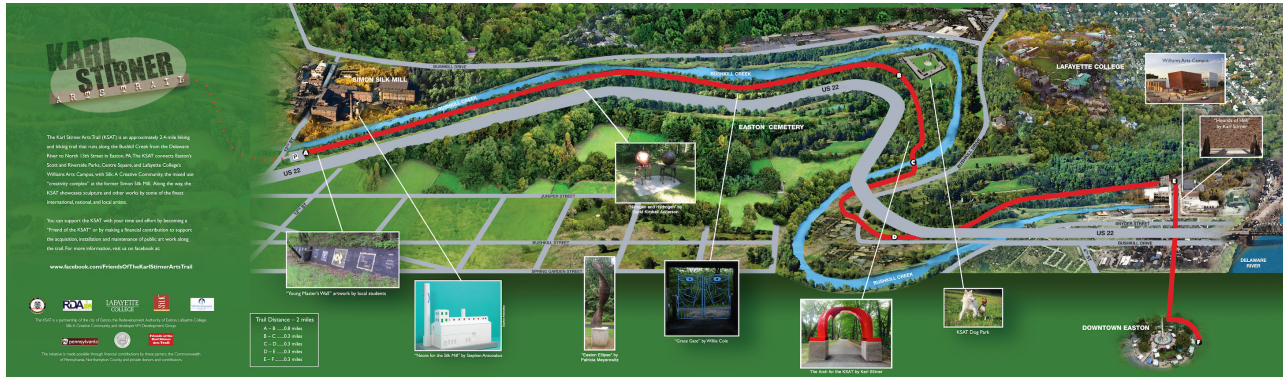


Figure 13: Brochure of the Karl Stirner Arts Trail. Photo from <http://sites.lafayette.edu/ksat-auction>

The Policy Analysis of the KSAT Musical Playground includes the system of principles to guide decisions. Within the scope of the broad need to build a social commons where people can gather safely, this space will offer aesthetic pleasure as well as a social space for the Easton community. The wide range of social policies help to better frame the more logistical policies regarding zoning and political barriers. With few legal hoops to jump through, the primary focus of the musical playground is the atmosphere it will create and how it will fit not only the setting of the trail, but also the greater community of Easton, particularly the Historic District, West Ward, and College Hill, the regions nearest the trail. The interactive nature of the instruments promotes a space for users to interact not only with the instruments, but also each other, as well as any passerby using the trail but not the musical playground. The dynamic this creates promotes a participation space, an area where users are invited to enter and actively take part in making music. Music, by its nature, creates noise, so it is important to ensure the noise created pleases, or at least does not annoy, those who use only the trail.

The community of Easton currently lacks a social space where people can gather with their children. There are several parks located throughout the City of Easton, but none within the area of the KSAT. By creating a musical playground on the trail, we will increase the amount of civic spaces in the community. While a playground brings to mind an area geared towards a younger age group, usually those children 12 years and younger, given the location of this playground and the likely users, equipment and a setup geared towards all ages, from preschool to adulthood, best fit the context of the situation. The users of the KSAT range from mothers pushing strollers with toddlers running around to professionals jogging the trail before or after work. Students from Lafayette College frequently jog the trail too, as do pet owners who often let their canines loose in the dog park, located next to the proposed location of the musical playground. While installing slides, swings, and a jungle gym would appeal appropriately to the younger crowd, it would not actively draw participation from the many joggers. The point of the musical playground is not to make the joggers stop and use the equipment, but rather to offer an appealing setting, that, should they like to stop and interact for a few minutes, they find an intriguing setting to do so. With this goal in mind, musical instruments that create real music and look professional were chosen. These instruments can be installed at either an adult height or a toddler

height, so to cater to all ages, some of the instruments could be installed at one level while others at another.

The atmosphere desired by installing the musical playground will further enhance the art theme along the KSAT, providing another sense the current static pieces do not: sound. From the Peace Candle constructed every year in the Center Square to the sculptures along the trail, those who walk by cannot help but notice the importance of art within the community. While the static pieces bring an element of thought and reflection, they fall short of actively engaging the observer in participation. The musical playground will overcome this limitation. Instruments installed next to the path invite them to come and participate, which “is, by its very nature, a dynamic activity” (Randell, 2004). To further the dynamics of participation, the instruments will be installed to face one another so that players can make eye contact, allowing for interaction not only with the instruments, but also with the other players.



Figure 14: The Peace Candle, Easton, PA. Photo from <https://www.pinterest.com/>

By making music using the instruments, users will become part of the trail, adding to the art which decorates its open areas. Unlike the sculptures, which trail users do not observe until they come upon them, the instruments will be heard—provided other users are playing the instruments—before trail users actually see them, illustrating the expanded impact range the auditory senses has over the visual. In the same way an audience sits in a blackened auditorium and listens to an orchestra on stage, so approaching users, when hearing the instruments being played, will become a part of the music. The orchestra on stage strives to make the music meaningful to the listener, the obvious indicator of their success is the magnitude, enthusiasm, and length of the applause rendered at the end. On the KSAT, no orchestra is looking for applause, but as someone plays and users approach, the effect of whether the music effectively connects with them can be measured by whether they too, stop and play. The sound cannot help but invite them, and combined with the beauty and intriguing qualities of the instruments, they will hopefully take a moment or two and become a participant with the art surrounding the trail.

While the instruments along the KSAT will actively invite users to interact with them, the question remains how the addition of instruments will impact the existing structure of Easton. Isolated as the location is, no residential homes or office buildings will hear the instruments, and therefore the possibility of music late on a summer evening will not prevent young children from falling asleep or a businessman from hearing his client on the phone. The trail technically starts in the Historic Downtown, but the segment of the trail on which the musical playground will be installed is near the base of College Hill, closer to the West Ward. Historic Downtown has undergone some serious renovations in the last ten years to make the area more attractive and safe. Local bands regularly play during the farmers' market or on summer evenings, so the addition of musical instruments fits into the culture of Historic Downtown.



Figure 15: The Manta Ray, manufactured by Freenotes Harmony Park. Photo from <http://freenotes-harmonypark.com>

Additionally, the multiple festivals held every year draw visitors from outside Easton, and although they would have to walk almost two miles to the instruments, it would provide another area of interest for those willing to make the trek. College Hill participants will include both college students and the stereotypical middle-class families with young children, both of whom will find the musical arrangement intriguing, and, more than likely, worth a visit. The West Ward is the last region from which regularly users can be expected. This region has the reputation as the rough area of Easton, so at the very least, the installment of a musical playground will provide a civic space for those residents to travel to and around which to gather. Overall, the addition of musical instruments along the KSAT fits into the overarching goal of community that city leaders are seeking to grow, as seen through the outdoor concerts and festivals held every year in Center Square. Community welfare will increase with the creation of a musical playground. By creating a space in the community where all are welcome and no one is limited by income, race, or any other

factor, a stronger community is born. In order to create a space like this, there must be public resources available, such as a musical playground, that can create such a space.

This is where the KSAT Board comes into play. The KSAT Board has complete autonomy over the trail, and [The City of Easton Department of Parks and Recreation](#) completely backs the KSAT Board. Political Barriers are not a huge issue in the designing of the musical playground because of the unique political situation. The KSAT Board is supportive of the musical playground and is very willing to support its design and construction. At this time there are no political barriers that will impede the development of the musical playground on the KSAT.

Zoning also plays an important role in community development. According to the City's website, when submitting a zoning permit application for new construction or additions/expansions of existing structures, a detailed site plan must be included showing the following information: property dimensions of both existing and proposed structures (square footage), the distance(s) between building(s) and property lines, the distances between structures, the location of impervious surfaces, and neighboring land uses. A complete layout and design of the musical playground can be found in the [Technical Analysis](#).



Figure 16: Google Images Ariel View of KSAT Musical Playground. Photo from maps.google.com.

Our biggest concern when building a civic space is the safety of the people who use the instruments there. The U.S Consumer Product Safety Commission outlined guidelines for

safety in public parks in their *Public Playground Safety Handbook* (2010). While this handbook is not a list of official rules, it discusses considerations for safe, age appropriate play on playgrounds, such as equipment material, maintenance, and visibility. While these aspects are important areas to consider when installing the playground equipment, playground equipment that does not meet these guidelines would be the exception, so finding equipment that adhered to the policies was not difficult. All the companies ship throughout the United States, so there are no issues with Pennsylvania state regulations.

Musical instruments make noise, and ensuring the noise levels do not disturb non participants is important. Fortunately, the chosen location along the Karl Stirner Arts Trail has no houses or businesses in its immediate vicinity. Bordered by a cemetery on one side and a creek on the other, the instruments will not disturb any residents or businesses. For those passing by, they can expect noise levels of 80-90 decibels, which is equivalent to a garbage disposal, dishwasher, blender, or power mower. Freenotes Harmony Park publishes a complete study on the [noise level](#) of their instruments. As the measurements are given in decibels, [Industrial Noise Control](#) provides common examples of decibel ratings.

The policies of a civic space must work to meet the needs of a community to its highest ability as ensuring the health and safety of the community of Easton is a major priority. If policies do not meet these standards, projects will fail the community. The musical playground is designed to serve the community as a civic space in which families can have a safe place to gather and engage.

TECHNICAL ANALYSIS



Figure 17: Freenotes Harmony Park musical instruments installed at PACE Center, Colorado. Photo from www.playgroundprofessionals.com

When choosing the equipment to install along the Karl Stirner Arts Trail, more had to be considered than simply what fit well in the area and the monetary budget. While keeping those aspects in consideration, we had to also analyze the current community setting and in what ways the addition of the musical playground will impact the KSAT and greater Easton community. An in-depth discussion of the community impact is discussed in the [Policy Analysis](#), but suffice to say musical instruments maintain the theme of the KSAT and will involve the users of the trail in a more interactive manner than the current sculptures and pictures. We anticipate the musical playground will become a location to gather, contributing to efforts Easton has made in the recent years to build a stronger community infrastructure.

The Manufacturers



Figure 18: Examples of outdoor musical playground instruments not deemed aesthetically sufficient. Photo from meyerdesign.com/galleries/index.php?catid=31

In order to keep with the art theme of the KSAT, the instruments chosen had to be both aesthetically and tonally pleasing. After searching, [Freenotes Harmony Park](#), a Colorado based company, stood out because of its quality instruments that not only look professional grade, but also produce a rich and full sound. Since the KSAT Board specified the most important criteria as aesthetics, the group selected instruments from Freenotes Harmony Park because they present the most eye appeal, and per [videos](#) on their website, demonstrated the instruments have both a pleasing and appealing sound. Some manufacturers, such as [The Meyer Design Group](#) also manufacture musical playground equipment, but their products consist of drums and chimes attached to plastic walls and do not pose as striking an appearance as the Freenotes Harmony Park instruments. [Schoolscapes](#) also offers outdoor musical instruments, but their instruments look, aesthetically speaking, somewhere between those of The Meyer Design and Freenotes Harmony Park.



Figure 19: The WonderChime by WonderWorx. Photo from www.wonderworx.com

When people think of a playground, they often think of slides, swings, monkey bars, and the like. While a musical playground can resemble the traditional idea of a playground, those that do tend to lose musicality because the instruments chosen are oriented towards rough and tumble play as opposed to musical play. [WonderWorx](http://www.wonderworx.com), a Colorado based company, offers a unique mix between the traditional playground equipment and musical playground equipment. Using the types of equipment found on a typical playground, the manufacturer designed their own versions of a swing and a seesaw to make music as the child plays. While we wanted to include some of the WonderWorx products in the plan because it would not only provide another outlet for the younger aged crowd, but also help bridge the popular idea of a playground with the musical playground, the products did not meet the aesthetic requirements. Decked out in bright yellows, bold blues, or olive greens, the instruments appear tacky and would have contrasted with the aluminum shine and more uniform colors of the Freenotes Harmony Park products.

Freenotes Harmony Park sells their instruments through distributors, the one for Easton, PA being General Recreation in Newtown Square, PA. To receive pricing for the Freenotes instruments, we contacted them, explained the project, and ran our ideas past them. Our representative is Steve Hemler, who will recognize the project by the keywords "Lafayette College," "Bike trail," "Freenotes Harmony Park," and "Seth Kyler." When ready to make the purchase, he can be contacted as shown below.

Stephen F. Hemler CPSI
General Recreation Inc.
steve@gen-rec.com
www.generalrecreationinc.com
717.761.2751 Office
717.761.2493 Facsimile
610.291.0329 Cellular

Figure 20: Contact information to purchase Freenotes Harmony Park instruments.

The Materials and Playground Infrastructure

Not much site maintenance is needed before installation of the instruments besides digging the holes for the instrument posts. Most instruments require holes at least 36" deep to go below the frost line and vary in diameter from 10" to 14" depending on the instrument. Some instruments, such as the [Tuned Drums](#), require a trench 6" deep and 5' by 2' to secure the instrument bases with concrete. The installation requirements of each instrument vary, but Freenotes Harmony Park provides detailed instructions via the [Spec Sheets/Install Info](#) page on their website. These spec sheets can also be viewed by following the hyperlink attached to the name of each instrument. The spec sheets also specify how many bags of concrete are needed for the installation of each instrument, which again, varies from instrument. Most instruments need only 4 bags of concrete, but some of the larger setups, such as the Contrabass Chimes, require 18 bags of concrete.

After the instruments are installed and the concrete has dried, an artificial, raised stone border called [Reversible Stone Landscape Timber with Spike](#) will be set up around the perimeter of the playground to clearly designate the area. Manufactured by [Child Works](#), these grey borders come in lengths of 4' and are pinned together and into the ground with a 2' spike. They are reversible with one side featuring rectangular, landscape stones and the other side rounded, river stones. Whoever installs the borders can decide which side to show. With a width of 5" and a height of 8", the borders will surround the playground area and hold the foundation and compressed stone topping in place. Although compressed stone is not normally an appropriate safety surface for playgrounds, the instruments have no fall height, and therefore, a surface designed to soften the impact of a falling child is not needed. In speaking with Steve Hemler of General Recreation, the company through whom the Freenotes Harmony Park instruments will be purchased, he recommended the compressed stone as it is cheaper than bonded mulch and does not move around as much as regular mulch.



Figure 21: Reversible Stone Landscape Timber with Spike. Photo from www.aaastateofplay.com



Figure 22: Compressed stone. Photo from www.laurelsandandstone.com

The most popular compressed stone, #57, is approximately 2" in diameter and can be commonly found in gardens, on paths, and other outdoor areas around houses. While the [#57 compressed stone](#) is more expensive than normal #57 stone, the compressed is better for walking and pathways as the stones will pack together, making it easier for walking or pushing a stroller over while still allowing for adequate water drainage. Only about 2" of compressed stone is needed, so the other 6" of surface depth can be filled with non-compressed stones or any other cheaper filler. If compressed stones were to be used as the only filler, the area, which is 1000 square feet, would require 28 tons of compressed stone as 1 ton covers about 150 square feet to a depth of 2" (How, n.d.).

Companies that manufacture outdoor musical equipment do so ensuring the instruments will withstand severe temperatures, snow, and ice. Freenotes Harmony Park manufactures their instruments out of polyester, powdercoated steel, and polycarbonate. Any plastic, which is used only in the drums, is recycled. For the instruments that require mallets, the mallets come tethered to a post with a nylon-coated, stainless steel cable. Occasional maintenance is recommended, but is easily done by anyone as it simply requires making sure the mallets are still attached to their respective posts and the instruments do not have dirt smears. Should any instrument require cleaning, the manufacturer recommends cleaning with soap and water, and, in the case of the aluminum chimes or keys, Goof Off – Heavy Duty Remover. Outdoor musical instruments are installed around the United States with great success, showing that the instruments do indeed withstand multiple seasons. Freenotes Harmony Park lists parks from California to Missouri to Pennsylvania that utilize their products, the closest one to Easton is located at The Crossing Abilities Playground in Mountain View Park, Tannersville, PA, about 30 miles north of Easton. A [complete map](#) of every Freenotes Harmony Park installation is available through their website.

The Instruments

Freenotes Harmony Park recommends choosing a minimum of three instruments and arranging them in a manner that allows players to maintain good eye contact with one another, encouraging interactive play. They offer a [guide](#) of their products, which specifies whether the instruments are percussive or sustaining, and their tone range (bass-alto-soprano). Percussive notes last for about one second whereas sustaining notes last for five or more seconds. Freenotes Harmony Park offers assistance in choosing instruments based on the size of the desired location, but their instruments require a space ranging from 1 ½' x 3' to 3' x 5 ½' per instrument. From discussions with the KSAT Board, the musical playground must include chimes that resemble a fence so that children can run alongside them, striking them with their hands to create music. To ensure a variety of instruments and sounds, we decided to also include drums. Given these two criteria, we searched through the various instruments offered and considered a variety of combinations before selecting the final proposal.



Figure 23: Premium Package Ensemble. Photo from <http://freenotesharmony.com>



Figure 24: Circular 360 degree bench. Photo from www.belson.com

The proposed musical playground will include five different instruments surrounding a full, 360 degree, circular bench. Freenotes Harmony Park sells the [Contrabass Chimes](#) and [Tuned Drums](#) as part of a discounted package called [The Premium Ensemble](#). Three other instruments come in the ensemble, the [Imbarimba](#), the [Pegasus](#), and the [Swirl](#). Together, these five instruments make up an ensemble that includes a variety of vertical chimes, horizontal xylophones, and drums of varying heights, creating a myriad of different sounds and an atmosphere appealing to every age. To ensure the musical fence meets the ideals of the KSAT Board, a second set of Contrabass Chimes will be purchased and installed in line with the first set against the back of the playground. Arrangement specifications show the instruments need at least a 15' diameter circle in which to be installed with proper spacing

between instruments. As the intended locations is 40' deep by 25' wide, there is more than enough room for the ensemble and extra chimes. [Belson Outdoors](http://www.belsonoutdoors.com) sells the bench in a variety of colors, of which we recommend black, and weights 1,120 pounds. In the hole surrounded by the bench, a tree should be planted.

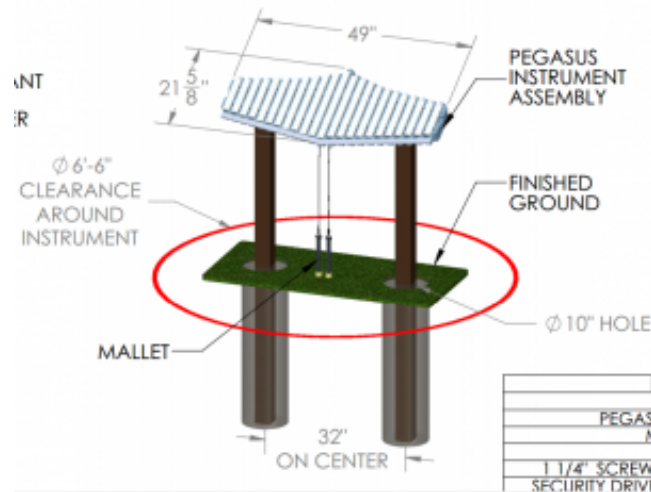


Figure 25: Pegasus Chimes Dimensions. Photo from <http://freenotesharmonypark.com>

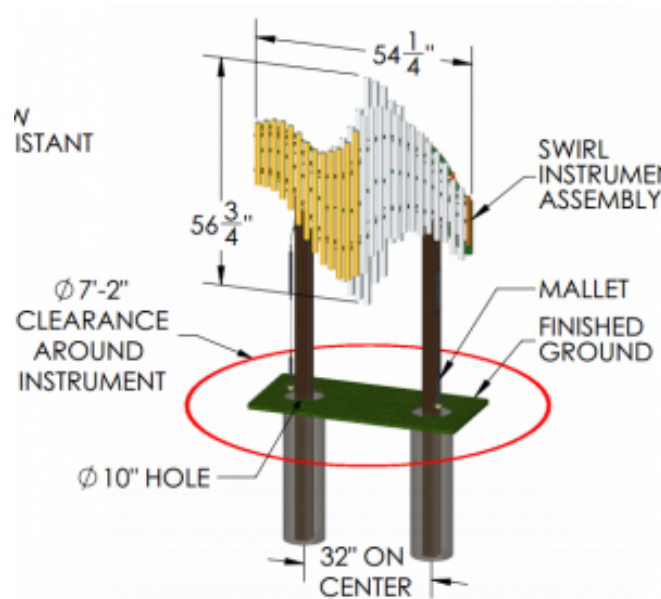


Figure 26: Swirl Chimes Dimensions. Photo from <http://freenotesharmonypark.com>

Spacing

The total area of the plot is 1,000 square feet, a rectangle 25' wide by 40' deep. This is ample room for the recommended layout, which is shown in Figure 27.

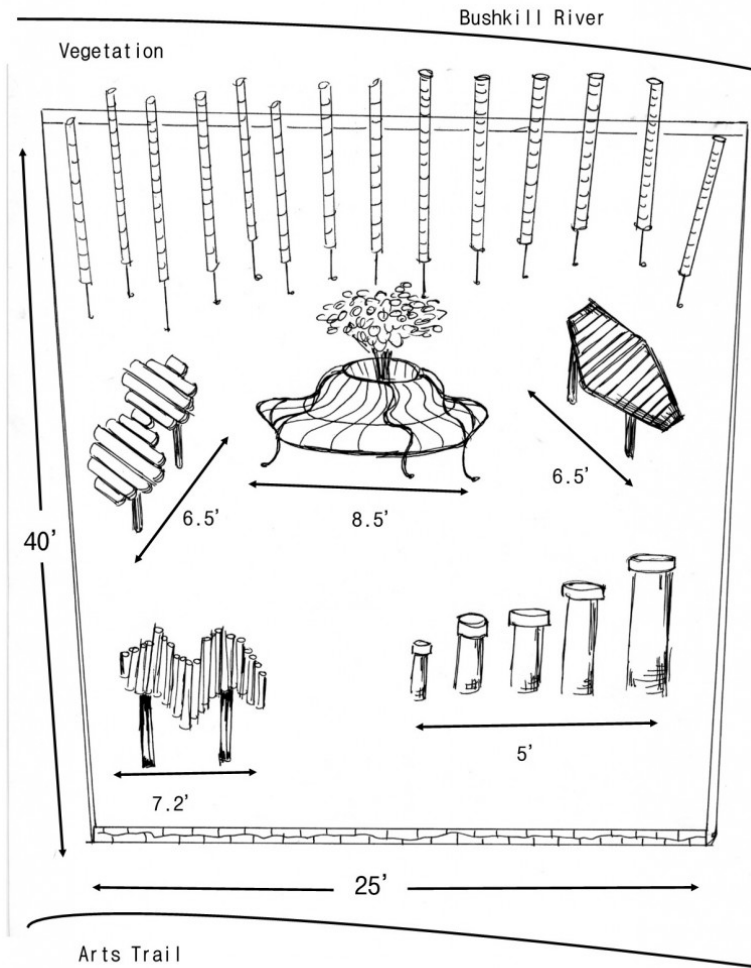


Figure 27: Proposed Playground Layout. Figure Created by Author.

In the center of the playground will be a circular metal bench where parents and other visitors can sit and rest, enjoying the sights and sounds of the space. The dimensions of the bench, as indicated in Figure 28, are 2' 8" in height, 8' 6" in total width, with a 4' diameter inside circle.

CIRCULAR BENCH | 48" I.D. 360 DEGREE

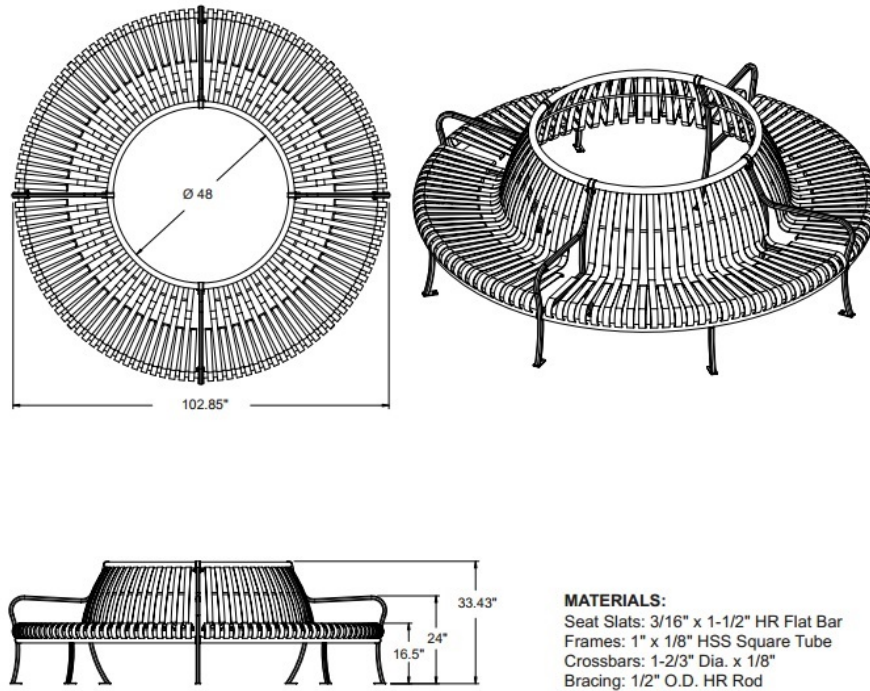


Figure 28: Circular Bench Dimensions. Photo from <http://www.belson.com/Dimensions.aspx?M=PCS-48-360>

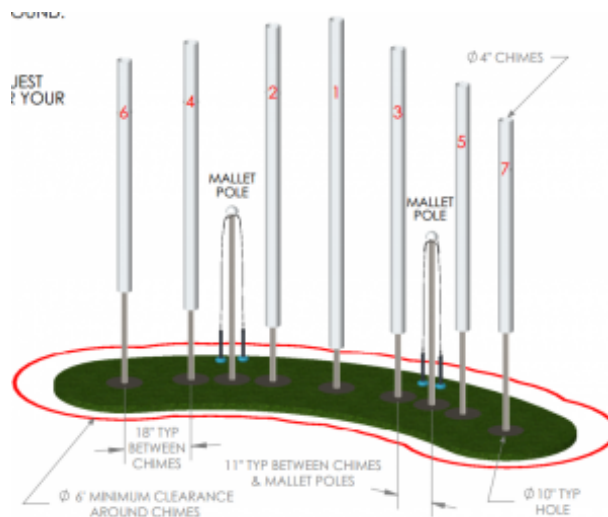


Figure 29: Detail of Contrabass Chimes from Freenotes Harmony Park; Photo from freenotesharmoniypark.com

Next, as shown in Figure 29, Contrabass chimes will frame the back wall of the playground, blocking visitors from the vegetation and river below. The chimes come in a set of 7, so we

will order two sets to adequately create the desired barrier. Through calculations we found that the 14 chimes and 4 mallet poles will need 25 feet along the back wall of the playground. The chimes can be arranged in any format from a straight line to an S-shape. To help form the playground, we recommend a slightly concave line, the chimes curving in towards the playground and KSAT. Regulations specify that each chime should be 18" apart from one another. As shown in Figure 29, each chime has a 4" diameter with 11" needed between the chimes and mallet poles. Additionally, there should be a 6' clearance around the entire chime assembly. Because we only want people to use the front side of the chimes as the chimes are meant to frame the inside of the playground, a 6' clearance is only necessary on the playground side of the chimes.

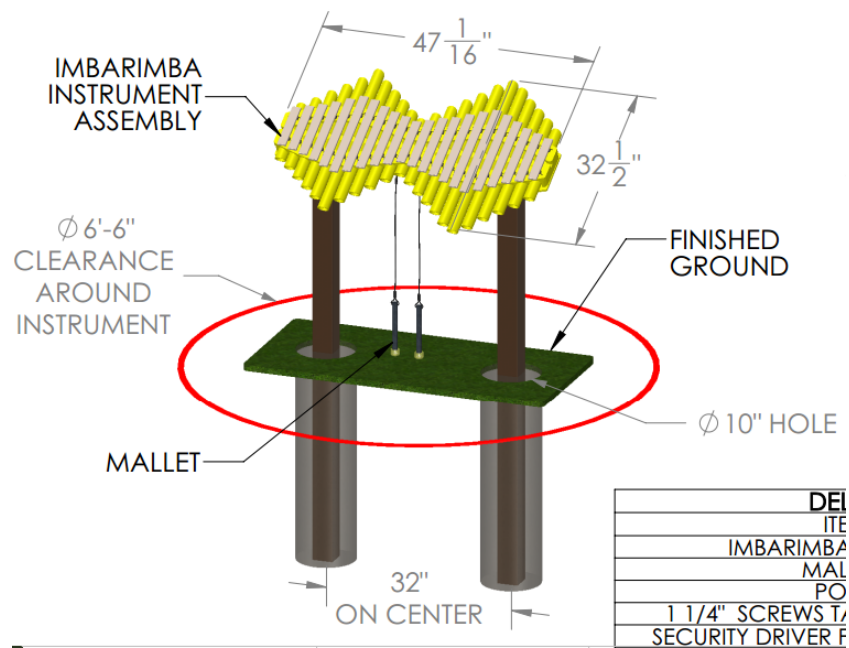


Figure 30: Detail of the Imbarimba installation. Photo from <http://freenotesharmoniypark.com>

FINISHED HEIGHT GUIDELINE:

AGES 3-5: 22"
AGES 5-7: 27"
AGES 7-11: 32"
ADULT: 36"

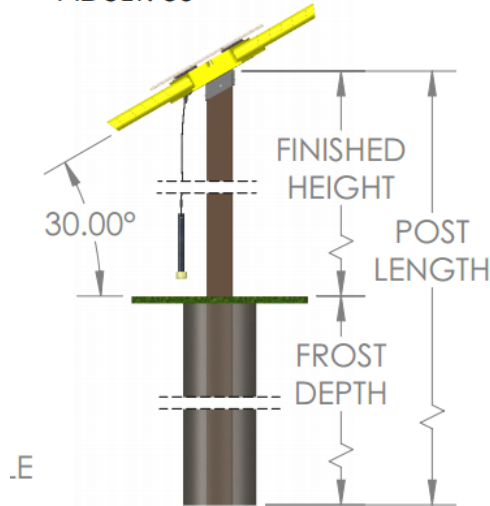
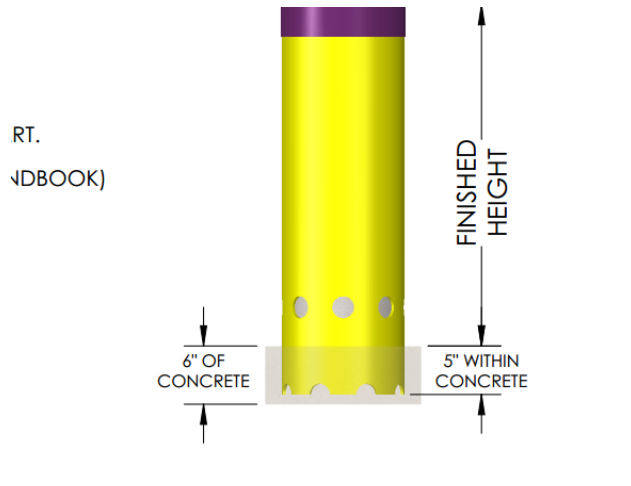


Figure 31: Height scale from Imbarimba. Photo from <http://freenotesarmonypark.com>

Since the instruments are different sizes and require different clearance areas, the arrangement had to ensure there was adequate spacing between the various fixtures. We suggest putting [Imbarimba](#) in the back left corner of the playground. The Imbarimba, a pentatonic instrument made of fiberglass bars combining the elements of a resonated xylophone and thumb piano that sounds like a gong, requires a 6'-6" clearance around the instrument, which has a width of almost 4' and a depth of 2' 8". Its stock color is yellow. The [Pegasus](#), which comes in sky blue, is made of 23 resonated aluminum bars in the key of C Major and A Minor that resonate like a gong. It will be installed in the back right corner of the playground. A 6'-6" clearance is required around the instrument, which has a width of 4' 1" and a depth of 1' 10". In the front left corner is [The Swirl](#), which produces pure, soothing tones from its resonated anodized aluminum chimes that range from soprano to alto. It comes in orange and requires a 7'-2" clearance around its 4' 6" vertical body. As The Swirl stands upright, the width is negligible and therefore not listed. Figure 31 shows the recommended finished height guidelines for the Imbarimba, with different heights specified for different age groups. We suggest using the height guidelines for ages 7-11 as this height of almost 3' will cater to children and adults alike. The Swirl and Pegasus can also be assembled at varying heights, so the instruments could be assembled at different heights to cater to all ages. For examples, the Pegasus could be assembled at the appropriate height for ages 5-7, the Imbarimba assembled at the appropriate height for ages 7-11, and the Swirl assembled at the appropriate height for adults. The final heights do not particularly matter and it ultimately comes down to a matter of preference. We recommend assembling all the instruments at the appropriate height for the 7-11 age group as this would be sufficient in catering to all ages, only requiring those very short or tall to either stretch or bend. To promote eye contact and interaction between participants playing the instruments, they should be installed so that the person playing is facing the center bench.



DELIVERY PARTS LIST / FINISHED HEIGHT			
ITEM	QTY.	ADULT FINISHED HEIGHT	TODDLER FINISHED HEIGHT
Ø 15" TUNED DRUM	1	37"	29"
Ø 12" TUNED DRUM	1	35"	27.5"
Ø 10" TUNED DRUM	1	33"	26"
Ø 8" TUNED DRUM	1	31"	24.5"
Ø 6" TUNED DRUM	1	29"	23"

Figure 32: Tuned Drums Finished Height Guidelines. Photo from <http://freenotes.harmonypark.com>

Lastly, in the front right corner we suggest putting Tuned Drums. Though the drums can come in two color schemes, we suggest choosing the rainbow color scheme for its colorful aesthetic appeal. As Figure 33 shows, the 5 drums each have a different diameter of 15", 12", 10", 8" or 6". To keep from children's heads from getting stuck in-between the drums, Freenotes Harmony suggests putting the drums either less than 3" apart or more than 9" apart. Our plan has the drums spaced out 10"-12" apart, both to ensure that children's heads do not get stuck and to allow for children to gather around and between the drums. Figure 32 shows the adult and toddler recommended heights for each drum. Since the other instruments will be installed at a height higher than that recommended for toddlers, we suggest implementing the toddler height here, on the drums, to include a component of the playground more specifically geared towards the very young.

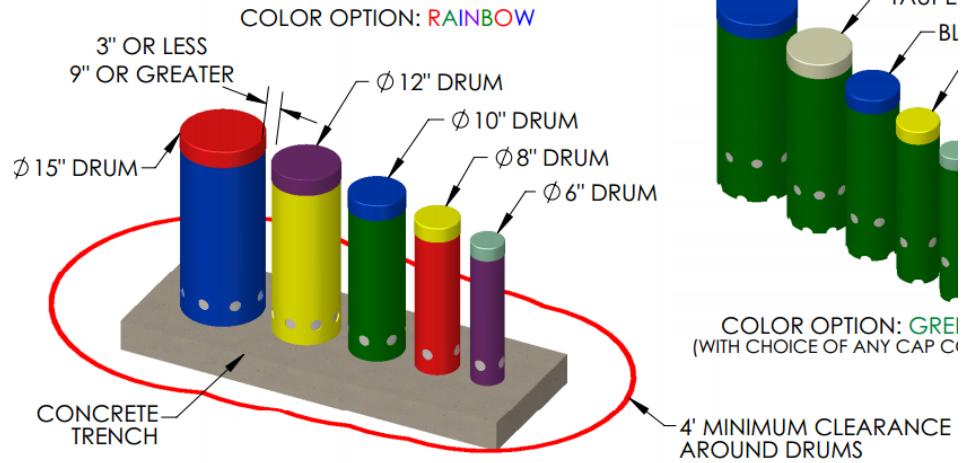


Figure 33: Tuned Drums Dimensions. Photo from <http://freenotesharmony.com>

Conclusion

Using the proposed arrangement, these five instruments and circular bench will fit nicely into the space allocated for the musical playground. With everything combined together, the environment created will be one that promotes musical participation and social interaction. Steve Hemler, the General Recreation contact, described the instruments as easy to install, so once purchased, the engineering class should have little difficulty beyond lifting the bags of cement, especially as the instruments come with detailed instructions.

ECONOMIC ANALYSIS

The feasibility study culminates with an assessment of the economic context for the proposed musical playground as no project can come to fruition without examination of the monetary costs involved. Our economic analysis provides a detailed report of how much, financially speaking, a musical playground for the Karl Stirner Arts Trail will cost, while also evaluating the many steps needed to construct the plan we have proposed. From clearing the park space to the inclusion of finishing touches such as garbage receptacles, the economic study considers many aspects from the ground up to ensure future success. Most of the monetary costs will complement the information of the Technical Analysis, but the economic section is not just a monetary summation of the instruments. Our analysis, reflective of the costs of the included instruments and 'technical' items, also provides dialogue to validate the decisions made. By taking into account the purposes of the selected items and matching them with the goals of the KSAT board, and in regards to the other contextual analyses and available monies, this extra scope ensures a more complete study. As a result, beyond the fact of making sure the project's goals are satisfied, the study highlights the most ideal musical playground for the KSAT and the community it will entertain.



Figure 34: One of the sponsors for the playground, the Easton Parks Department, will supply half of the budget. Photo from www.easton-pa.com/ordinances

Due to the generosity of the Easton Parks Department and the good relationship they have with the KSAT Board, there is \$60,000 to \$70,000 available to construct the playground. The Easton Parks Department has access to \$30,000 to \$35,000 left over from past projects. They are willing to designate these funds for the musical playground project depending on how much will be matched by the Lafayette community. Ideally, a Lafayette College alum would be the best option to receive the optimal amount, but this money can be funded through organizations or departments willing to add to the budget for it. The money will cover everything from the site preparation of the area to purchasing appropriate ground covering and securing sufficient cement mixture for the instruments. As the Engineering Studies 480: Sustainable Solutions spring 2016 class will construct the

musical playground, the cost of clearing the space is minimal to none. As such, the majority of the money is to be spent on the purchasing and shipping of the instruments, allowing for a larger and more diverse arrangement.

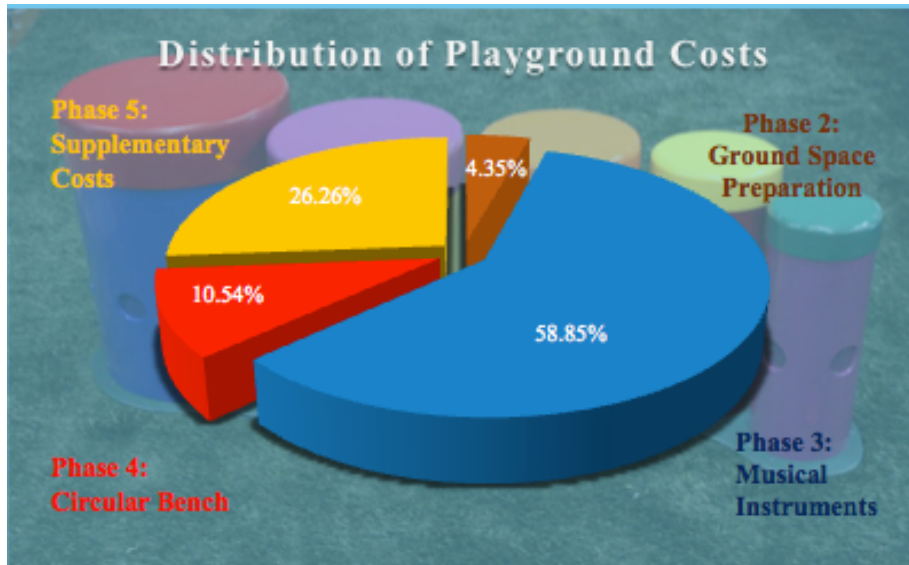


Figure 35: Distribution of the playground proposed costs. Created by Author

As shown in Figure 35, and subsequently broken down below, costs were divided into 5 major phases.

Phase 1: Clearing of Park Space

Phase 1 is not displayed in the chart as a monetary cost since the Sustainable Solutions class will provide the installation service themselves, and therefore, no fees are anticipated. Should an unanticipated cost arise, the needed funds can be taken from the Phase 5: Supplementary Costs portion of the budget, which was designed to include extra funds for any unanticipated financial costs. Lafayette College's aid is represented in this phase through their commitment to establishing a successful, feasible musical playground by incorporating the construction of the instruments into the curriculum of one of their courses. This, in addition, provides less fees in terms of outsourcing the service to a third party. Participation in the class will also supply the students with a hands-on experience from which to learn and build for their own personal goals, showing that the project incorporates more than just providing a playground for children in the community

Phase 2: Ground Space Preparation

Item	Description	Quantity	Price
Concrete bags	\$4.15/bag	53 bags	\$219.95
Compressed Stones	\$30-35/ton	28 tons	\$840.00
Reversible Stone w/ Stake	\$32.75 (HDPE) timber	32 pieces of plastic	\$1,048.00
Shipping			\$298.00
		Totals:	\$2,405.95

Figure 36: Detailed cost of Phase 2. Created by Author

Phase 2 consists of preparing the ground space for construction. More information on the intricacies of setting the instruments up is found in the [Technical Analysis](#). As the cement is used to anchor the instruments in the ground, enough is required to make sure each instrument is installed firmly. Cost for the compressed stones will vary depending on how far the trucks must travel from the quarry to the site location, but the price per ton tends to decrease if more than 23 tons are being purchased. Phase 2 costs close out with the totals for the reversible border timber and stakes, cost of shipping included. The items in Phase 2 take into account the recommendations of Steve Hemler at General Recreations, such as compressed stones over bonded mulch, which result in a reduced cost and better choice of ground material for the functionality of this type of playground.

Phase 3: Musical Instruments

Company	Instrument Name	Description	Quantity	Price
Freenotes	Contrabass Chimes	7 chimes, 2 mallet poles, 4 mallets (attached)	-	\$5,100.00
Freenotes	Tuned Drums - In-Ground	5 PVC hand drums	-	\$2,900.00
Freenotes	Pegasus	23 note resonated <u>metalophone</u> , 2 mallets	-	\$4,100.00
Freenotes	Imbarimba	22 note resonated xylophone, 2 mallets	-	\$4,200.00
Freenotes	Swirl	26 note resonated <u>metalophone</u> , 2 mallets	-	\$5,100.00
Freenotes	Contrabass Chimes	7 chimes, 2 mallet poles, 4 mallets (attached)	1	\$5,100.00
			6	
		No Substitutions (saves \$2,400, reflected in price)		\$24,000.00
		Shipping	\$350/Instrument	\$2,100
		Totals:		\$26,100.00

Figure 37: Detailed cost of Phase 3. Created by Author

In Phase 3 the total cost of purchasing and shipping the main components of the musical playground are broken down. After much tinkering and discussions surrounding other set ups, products, and companies, we felt the Premium Ensemble from Freenotes Harmony Park provided the most economically fit instruments that were also musically sound and aesthetically pleasing. We choose the Premium Ensemble because of the variety of instruments procured and the discount that comes along with the purchase of the package.

A total of \$2,400 is saved when choosing the specified ensemble over purchasing the instruments separately. Although the instruments will be sold to us through General Recreation, the instruments will ship directly from the manufacturer in Colorado. A firm shipping estimate will have to be procured when everything is ready for the instruments, but Steve Hemler at General Recreation gave a \$350 estimate on how much it would cost to ship each instrument via freight from Colorado.

Phase 4: Circular Bench

Company	Name	Description	Quantity	Price
Belson	Premier Circular Tree Bench w/ Back	Welded, Steel frame (Back and seat) 360°	1	\$4,675.00
		Shipping (TBD)		
			Totals:	\$4,675.00

Figure 38: Detailed cost of Phase 4. Created by Author

Although displaying only one item, Phase 4 included a proposal to sufficiently address the problem of civic space along the trail. We decided that a circular bench, placed right in the middle of the playground, would be a great addition as it will allow for those sitting on the bench to observe players using any of the instruments. Belson provides a steel frame, 360 degree bench that children and patrons of the KSAT can sit and relax on while still appreciating the environment and sounds of the playground and trail. Due to the adequate, yet not overly large, area where the musical playground will be installed, the smaller of the two bench sizes was chosen, which contributed to keeping costs down.

Phase 5: Supplementary Costs

Stylish Urban Style Planter	1	\$820.00
20 Gallon Trash Receptacle	1	\$825.00
Misc./Labor Costs	N/A	\$10,000.00
	Totals:	\$11,645.00

Figure 39: Detailed cost of Phase 5. Created by Author

Rounding out the last stage, Phase 5 includes supplementary aspects of the playground that were considered in regards to the goals of aesthetics and civic space. Belson, the company selling the circular bench, also provides a planter and trash receptacles in their inventory. The planter will be placed in the middle of the bench, as opposed to the trash receptacle residing in this area, to add to the aesthetics highlights achieved by the playground. In order to promote a clean environment for the users of the playground, Belson's trash receptacle was also included in the economic study. In regards to supplemental labor costs that could occur in the construction of the project, we have allotted \$10,000. Since our final projected expenditures of about \$45,000 happens to fall below the allotted budget line given for the project, fluctuations in these miscellaneous costs should not affect the overall feasibility of the playground when considering the financial burden of the project.

Over time the musical playground will need some type of maintenance and potentially, replacement parts, although not enough to flag it as a future major issue that needs to be addressed immediately. Care of the instruments, which consists of wiping them down with soap and water if they are dirty, could be carried out by volunteer groups, several of which regularly pick up litter along the KSAT. Should an instrument or piece be broken, replacements can be purchased through the original manufacturer. This, obviously, would require a sum anywhere from \$100 to \$4,000, depending on the part of instrument being replaced. The most likely part to need replacing are the mallets, which are tethered to poles by nylon-coated steel cables. Anything, however, can be broken with persistence, especially if the playground becomes very popular. Since compressed stones will be used, weekly maintenance to address the ground space is not necessary, as opposed to a constant replacement every 2 to 3 years if mulch was used. As such, little to no regular maintenance is needed for the musical playground, and what maintenance is needed can be done based on when appropriate help is available.

CONCLUSION

Sociotechnical System

Creating a musical playground is not as simple as buying all the supplies that go into a playground: equipment, compressed stones, cement, and park benches. And it is certainly not as simple as installing these supplies and calling it a day. Creating a musical playground requires a much larger system of interaction between members of the community, the City of Easton Public Works, the KSAT Board and Lafayette College. Therefore, throughout our project we have sought to work within a sociotechnical system, taking the larger social, political, technical and economic contexts into account while planning the proposal. It is this sociotechnical analysis that separates an Engineering Studies project from a project in any other engineering discipline and therefore what we sought to stress throughout the proposal. The implementation of the playground requires a great deal of collaboration among the pre-existing trail and surrounding environment, the community groups using and benefiting from the musical playground, the technical and political actors instrumental in implementing the area and the instruments themselves that make up the playground. Figure 40, shown below, is a visual representation of the sociotechnical system that we believe is strongly involved in the creation of a musical playground on the Karl Stirner Arts Trail. Together, these parts of our sociotechnical system will work together to build an even greater and more tightly knit Easton community.

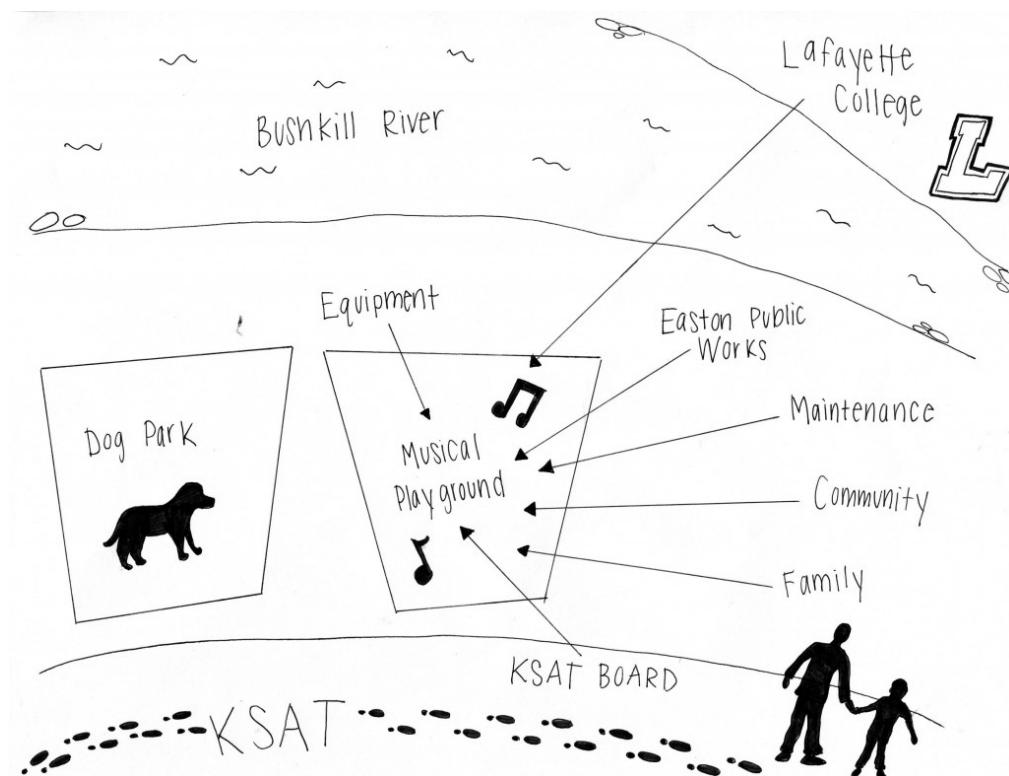


Figure 40: Representation of the musical playground Sociotechnical System. Drawn by Author

Summary

The purpose of our project was to propose a plan for a musical playground on the Karl Stirner Arts Trail that fulfilled the goals of providing a civic space and promoting art in its many forms. The proposed arrangement not only incorporates a bench to better integrate the area as a community site, but also includes the aesthetically and acoustically pleasing Premium Ensemble produced by Freenotes Harmony Park. This ensemble includes a variety of chimes and resonated xylophones named the Contrabass Chimes, the Imbarimba, The Swirl, the Pegasus, and the Tuned Drums. Together, these five instruments, the additional set of Contrabass Chimes, and the bench will frame the social impact we envision the musical playground having alongside the KSAT.

The feasibility study detailed throughout this website laid out the areas of potential impact the musical playground will have on the greater Easton community, as well as the logistics of implementing the instruments and surrounding infrastructure. A musical playground provides social benefits in its ability to create a positive playground environment as music can decrease anxiety and increase enjoyment in visitors in addition to providing educational and therapeutic benefits that assist with learning or mental disorders.

When the time comes to build the playground, there is little political red tape over which to be concerned because this project came from the KSAT board and is already supported by the Easton Parks Department. The zoning laws require indications of nearby buildings and structures and ensuring the park is up to safety regulations, but located as the musical playground will be away from any buildings, there are few zoning laws that are actually applicable to the situation besides anything to do with the river.

The durable and outdoor instruments manufactured by Freenotes Harmony Park are not difficult to install as they come with detailed assembly directions and spacing specifications. In the chosen area, which is 40' deep and 25' wide, the instruments will fit close enough to promote interaction between players on different instruments, but far enough from each other so as to leave enough room to move around them. Cement, compressed stones, and the border timbers completes the list of construction materials needed to create the musical playground.

The total anticipated cost for the project, including site preparation and cost of the instruments and bench is estimated to be about \$45,000. The majority of the money will be spent on purchasing and shipping the instruments to Easton. As the Sustainable Solutions class will construct the playground, the cost of labor, which is normally a large part of a budget, is not a large factor. Overall, the proposed plan is within the budget indicated by the KSAT Board, a contributing factor to make the plan feasible.

In conclusion, the musical playground proposed alongside the Karl Stirner Arts Trail is socially, politically, technically and economically feasible. The study shows that when the playground is implemented, it will have a positive impact on the greater Easton community.

Next Steps

The next step for this project is for the park to be implemented in the spring of 2016 by the Engineering Studies class Sustainable Solutions. Armed with this study and the proposed plan, they can focus on the logistics of bringing the instruments and other construction supplies to site without having to worry about the quality of what they are purchasing or how the instruments will fit into the community. That part is already done, and as laid out on this website, the instruments and equipment were chosen because they will fit into the community and the vision the community has for itself.

An aspect of this playground that was not studied in the scope of this feasibility study, but would behoove someone to analyze, is to look into the potential noise disturbances created by the playground. The volume of the musical notes produces is talked about briefly towards the end of the [Policy Analysis](#), but it does not touch on how the sound from the instruments will travel and the effect this will have on the students of Lafayette College and the larger Easton community. The chosen instruments sound good together and will therefore ideally not create loud and unpleasant noises for the users of the trail and surrounding community, but sound does carry, especially up. As Lafayette College is on top of the hill around which the KSAT winds, the instruments will certainly be heard, especially on a clear evening. Otherwise the trail, and therefore the playground, is somewhat isolated, not surrounded by homes or businesses to be disturbed. The hope is that an analysis will show that the playground will produce soothing noises that, even when they travel, do not disturb the surrounding community.

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