

# Healthy K-12 Educational Facilities: Promoting Health for the Individual as well as the Community

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## ABSTRACT

The focus of this essay is the design of Healthy K-12 Educational Facilities to promote health of the individual as well as the community. The term *health* can be defined as the mental and physical wellness of the individual, given his or her own personal goals. Health is investigated to promote: physical activity, mental soundness, social stability, nutritious consumption, and environmental awareness for the individual as well as the community. The intent is for health to become second nature. To accomplish the primary goal of personal health and wellness, this essay reviews and assesses *The Active Design Guidelines* and creates supporting arguments through the literary work of Richard Gerver, *Creating Tomorrow's Schools Today*. Two case studies: the Federal Environmental Agency by Sauerbruch Hutton and Marysville Getchell High School Campus by Craig Mason and DLR Group are utilized as precedents, but are also critically analyzed. The conclusion introduces an existing site with the potential for the design of a Healthy K-12 Educational Facility. Within this proposal is the development of a *complete system* made up of specific programmatic strategies, which are crucial to the design of a Healthy K-12 Educational Facility, promoting health for the individual as well as the community.



Figure 1. *Change Ahead* by Larry Ehl.

## INTRODUCTION

The world is constantly changing and evolving. The list of things changing in the world includes, but is not limited to: science, literature, music, art, architecture, politics, laws, economics, careers, cultures, technology, environment, and health. The world is changing second by second, even nanosecond by nanosecond. In the time it has taken to write this sentence, new discoveries and inventions have begun to change the world in which we live. However, the world is facing enormous issues, which includes, but is not limited to: health problems, the lack of a social center, and environmental crises. If this is the case, how do we prepare future generations for a world that does not yet exist?

The mere fact that the world is constantly changing may be quite unnerving. However, because the world is constantly changing, people have the capability to change the world. While studying at the University of

Kentucky, a professor by the name of Gary Rohrbacher said to me, "A student studies to become an architect because he or she refuses to accept the world the way it is. Some people were born to take the world for what it is; others were meant to challenge the world for what it can be."<sup>1</sup> As architects, challenging the world to reach its full potential, we have the ability to positively impact entire communities. The design of Healthy K-12 Educational Facilities is a critical building typology in positively impacting the health of the individual, but also of an entire community.



Figure 2. *Massive Change* by Bruce Mau.

As Canadian designer, Bruce Mau once said, "Massive change is not about the world of design; it's about the design of the world."<sup>2</sup> The design of Healthy K-12 educational facilities has the potential to promote massive change. Richard Gerver, author of *Creating Tomorrow's Schools Today* states that future

<sup>1</sup> Rohrbacher, Gary. Fall 2011. Lexington,

<sup>2</sup> Mau, Bruce, and Jennifer Leonard. *Massive change*. London: Phaidon, 2004.



generations will need to be: self-confident, adaptable, naturally creative, understanding of their strengths and weaknesses, capable of building strong relationships, and prepared for the challenges of their future.<sup>3</sup> He also states, “Who students are and who they will become has been and always will be dependent on the environment that surrounds them.”<sup>4</sup>

The design of Healthy K-12 Educational Facilities becomes evident because students spend majority of their time in educational facilities. Students begin full-time school at the age of six, spending three-fourths of every year inside of an educational facility. Within the duration of nine months, students spend one-third of every weekday inside of an educational facility. How can the design of Healthy K-12 Educational Facilities promote physical and mental health for the individual as well as the community?



Figure 3. Coordinate School Health by LPH1.

<sup>3</sup> Gerver, Richard. *Creating tomorrow's schools today education – our children – their futures*. London: Continuum, 2010. 7.

<sup>4</sup> *Ibid.*, p. 11.

## DEFINING HEALTH

The first priority of this building typology is to promote personal health. The term *health* can be better defined as the mental and physical wellness of the individual, given his or her own personal goals. Health is investigated to promote: physical activity, mental soundness, social stability, nutritious consumption, and environmental awareness for the individual as well as the community. The intent is for health to become second nature.

Health has a major impact on the self-confidence of a student. Richard Gerver's advice on "Creating Tomorrow's Schools Today" states that the importance of a student to feel self-confident is directly correlated with the student's success. Unfortunately, obesity is the number one health problem of the twenty-first century. *Architect* magazine published an article on worldwide obesity in April of 2011 titled, "We're Number One!". Although the title is meant to be playful, it is stating that America is the leader of obesity.<sup>5</sup> According to Dr. Donald Schumacher's publication, *Overcoming Obesity in Childhood and Adolescence*, at least one out of four students at every school is at an unhealthy weight.<sup>6</sup> If incorporated into the design of Healthy K-12 Educational Facilities, physical health can have major positive impacts on a

<sup>5</sup> "We're Number One!" *Architect Magazine*, April 2011. Web.

<sup>6</sup> Schumacher, Donald, and J. Allen Queen. *Overcoming obesity in childhood and adolescence: a guide for school leaders*. Thousand Oaks, CA: Corwin Press, a Sage Pub. Co. :, 2007.

student's personal health and wellness, academic achievement, and emotional-social development.

## METHODOLOGY

Throughout this paper, I explore the design of Healthy K-12 Educational Facilities in order to promote health for the individual as well as the community. To accomplish the primary goal of personal health and wellness, I review and assess *The Active Design Guidelines* and create supporting arguments through the literary work of Richard Gerver, *Creating Tomorrow's Schools Today*. Two case studies: the Federal Environmental Agency by Sauerbruch Hutton and Marysville Getchell High School Campus by Craig Mason and DLR Group are utilized as precedents, but are also critically analyzed. The conclusion introduces an existing site with the potential for the design of a Healthy K-12 Educational Facility. Within this proposal is the development of a *complete system* made up of specific programmatic strategies, which are crucial to the design of a Healthy K-12 Educational Facility, promoting health for the individual as well as the community.

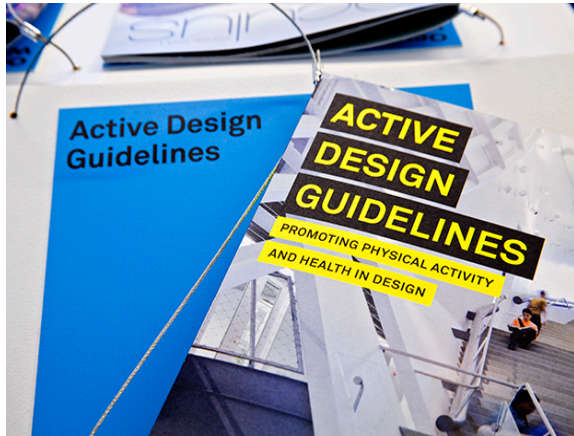


Figure 4. *Active Design Guidelines* by Jared Green.

## THE ACTIVE DESIGN GUIDELINES: PROMOTING PHYSICAL AND ENVIRONMENTAL HEALTH

In the 19<sup>th</sup> and early 20<sup>th</sup> centuries, architects and urban activists helped to defeat infectious diseases such as cholera and tuberculosis by designing better buildings, streets, neighborhoods, clean water systems, and parks. In the 21<sup>st</sup> century, designers can again play a role in contesting the most rapidly growing public health epidemics of our time: obesity and its impact on related chronic diseases such as diabetes, heart disease, and some cancers. Today, physical inactivity and unhealthy diet are second to tobacco as the primary causes of premature death in the United States. A growing body of research suggests that evidence-based architecture and urban design strategies can increase regular physical activity and healthy eating.<sup>7</sup>

<sup>7</sup> *Active Design Guidelines: Promoting Physical Activity and Health in Design*. New York: City of New York, 2010.

The Active Design Guidelines were developed by New York City, providing architects and urban designers with a manual of strategies for creating healthier buildings, streets, and urban spaces. Active design encourages stair climbing, walking, bicycling, transit use, active recreation, and healthy eating. Opportunities for incorporating daily physical activity cannot only be found in the outdoors, but also inside of buildings. Architects can promote physical activity into the daily routines of building occupants through the following guidelines:

1. *The design of the building's circulation system – the interior spaces, corridors, stairs, elevators, and lobbies that connect a building's programmed spaces.* The circulation system provides opportunities for walking, the most popular type of physical activity. Stairs and ramps should be designed attending to principles of universal accessibility;

2. *The design of individual building elements such as stairs, exercise rooms, shower rooms, bicycle storage, or plazas.* The design of these elements can either promote or deter activity through their availability, convenience, desirability, safety, and comfort. Providing conveniences like drinking fountains and benches can further support physical activity. In contrast, features such as unneeded escalators, an overemphasis on elevators, and barriers like door locks, grade changes, non-ergonomic design, and poor placement of building elements can deter physical activity;

3. *Careful organization of the building program to encourage walking between destinations.*

Building inhabitants can exercise through regular travel to the main office, gym or cafeteria;

4. *The provision and design of programmed activity spaces for physical activity.* Examples include: exercise rooms, swimming pools, running tracks, multipurpose rooms, and other specialized spaces designated as venues for physical activity.<sup>8</sup>

In addition to these four main guidelines, the massing and exterior design of the building's structure can also encourage physical activity. Research on the relationship between façade design and physical activity suggests that buildings that incorporate human-scale detailing, multiple entries, transparency, canopies, exterior stairs, porches, and terraces encourage the creation of a walkable/bikeable street environment.

Finally, the siting of a building can also have a significant impact on physical activity levels, particularly through the design of pedestrian paths, street connectivity, and outdoor spaces.

#### **THE ACTIVE DESIGN GUIDELINES: CRITICAL ANALYSIS**

Although many of the guidelines suggest reasonable design strategies, it is important to understand the integration of the *Active Design Guidelines* within the design of Healthy K-12 Educational Facilities instead of mere application. Unfortunately, the *Active Design*

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<sup>8</sup> *Ibid.*, p. 68.

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*Guidelines* are presented as a checklist. This creates the misconception that by checking the boxes; the design will be healthy. An example may include: the placement of bike racks instead of the careful planning and designing of the incorporation of the bike into the landscape. Another example may include: the planting of vegetation instead of the integration of green spaces into the building's infrastructure. In order to increase the longevity of healthy design, the strategies must connect and interrelate.

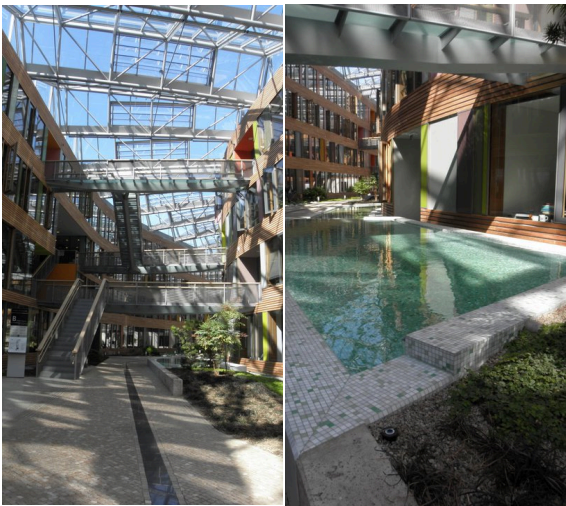


Figure 5-6. Federal Environmental Agency by Jenna Martini.

### **CASE STUDY #1: THE FEDERAL ENVIRONMENTAL AGENCY IN DESSAU GERMANY BY SAUERBRUCH HUTTON (2005)**

The Federal Environmental Agency in Dessau, Germany, designed by a Berlin firm, Sauerbruch Hutton incorporates the *Active Design Guidelines*. The main goal of the design was to build the most sustainable building possible in order to provide energy for

the city of Dessau. However, the design also incorporates strategies promoting health of the individual as well as the community.

The Federal Environmental Agency in Dessau, Germany contains a double-loaded corridor with an open atrium to mark the public areas, which reside primarily on the first floor. The public areas are located on the first floor to encourage the occupants to travel along the long double-loaded corridor. All elevators are hidden adjacent to secondary stairwells within the exterior core made up of individual offices. Visible, appealing, and comfortable stairs are conveniently placed for everyday circulation to one's individual office. The hanging hallways linking individual offices encourage occupants to engage and interact.



Figure 7. Federal Environmental Agency by Allard de Goeij.

Sauerbruch Hutton placed the building to the east of the site, allocating the western half to a public park. The building exterior and massing is curved with bicycle and walking pavements adjacent to the façade. The only available aboveground parking is bicycle parking. The exterior façade is about 40%

glazed with an elegant composition of double-paned windows, larch spandrels, and safety glass with enamel finish in thirty-three different shades, which correspond to adjacent site elements (for example: ponds, trees, etc.). This creates a dynamic effect as one walks or bikes around the building's exterior.



Figure 8-9. Federal Environmental Agency by Sauerbruch Hutton.

### CASE STUDY #1: CRITICAL ANALYSIS

Although the Federal Environmental Agency is primarily an office building, its design is applicable to the design of a Healthy K-12 Educational Facility. The Federal Environmental Agency is a prime example of the incorporation of the four main Active Design Guidelines into the built environment. This case study advocates sustainability, but also promotes daily physical activity. If we begin to understand the incorporation of these guidelines into the design of the built environment versus the mere application of a checklist, the result will be health of the individual as well as the community.

Argumentatively, the Federal Environmental

Agency is a European building. Therefore, ADA is not an issue. It would be very difficult for an individual in a wheelchair to navigate throughout the building. Also, the coarse stone pathways are unsupportive of those in a wheelchair. Healthy design should not imply inconvenience.

Also, the Federal Environmental Agency would have benefited from designing in light of the *Active Design Guidelines*. The knowledge of their existence could have positively influenced the design. First, Sauerbruch Hutton could have been more creative in the design of the public corridor to promote physical activity. Third, the site selection is not entirely convincing. Although the site is large and located a few miles from the train station, it is completely secluded and therefore, uninviting to the city of Dessau. Lastly, the design could have been more inventive within the programmatic selection. The Federal Environmental Agency contains a visitor center, library, and restaurant, but it unfortunately does not include a community center. The end goal should be to positively influence the entire community.



Figure 10. Creating a Sense of Community by Friendship Service Center.



## A SENSE OF COMMUNITY

Many times all it takes is one person. Influencing one student, can lead to the influencing of two students; two students can lead to five students; five students can lead to a classroom; a classroom can lead to an educational facility; an educational facility can lead to an entire community. Influencing one student can also lead to the influencing of one family member; one family member can lead to one family; one family can lead to two families; two families can lead to a neighborhood; a neighborhood can lead to an entire community.

Gerver states, "The truly great school is one that recognizes that it does not house the font of all knowledge, kept safe behind a gate through which only the chosen can enter. It realizes that it is a delta from which many tributaries flow for all to explore."<sup>9</sup> Creating social stability can lead to the success of the students within an educational facility.

A quarter of the students in the United States will not graduate high school. Drop out rates are directly correlated with a student's feeling of neglect and incapability. Gerver also states, "We can all help to provide richer, more meaningful experiences for our youth. If education is about stimulating the development of aspiration and of values in our children, if it is about helping them connect with and find a sense of purpose in their

<sup>9</sup> Gerver, Richard. *Creating tomorrow's schools today education – our children – their futures*. London: Continuum, 2010. 51.

communities, then as communities, we must all work to make this happen."<sup>10</sup> A sense of community has been proven to help K-12 students with finishing high school because it has the ability to create a sense of place, meaning, belonging, purpose, and engagement.



Figure 11. MGHSC by Ricardo Kanbarar.

## CASE STUDY #2: MARYSVILLE GETCHELL HIGH SCHOOL IN WASHINGTON BY CRAIG MASON AND DLR GROUP (2010)

The second case study, known as Marysville Getchell High School Campus (or MGHSC) in Washington, attempted to create a sense of community while incorporating the four main *Active Design Guidelines*. The High School was struggling from a district plague by years of bond failures and overcrowding. The solution to the problem was a high school, which initiated a fresh start with collegic learning tracks and a complementary campus, designed and completed in August of 2010 by Craig Mason and DLR Group.

<sup>10</sup> Ibid., p. 51.

At MGHSC, students circulate along raised boardwalks between five school buildings (or Student Learning Centers) with hovering roofs modestly suggestive of the bungalows, which are common to the West Coast. Directly adjacent to a suburban development, the campus is tucked into a forest, making MGHSC feel more like a college than a high school.<sup>11</sup>



Figure 12. MGHSC by Ricardo Kanbarar.

Walking through the campus, one would not guess that during the last decade the district suffered a 49-day teachers' strike, extremely low graduation rates, and overcrowding. In 2006 the district passed a bond to build a new high school. The Seattle office of DLR Group designed a campus made up of four SLCs (or Student Learning Communities), each with its own building: The School for the Entrepreneur, Bio-Med Academy, Academy of Construction and Engineering, and International School of Communications. The Campus Commons acts as the community center joining all SLCs, and contains a gym, dining room, and fitness

room, which has been said to "put most health clubs to shame"<sup>12</sup>.

DLR's principal in charge of design, Craig Mason, has been designing schools for twenty years. The SLC individual buildings were a result of working with the community and design committee made up of school and district administrations, teachers, and parents. In fact, Craig Mason and his team at DLR Group developed the flexible learning spaces, which do not actually respond to a particular curriculum; but instead support the district's guiding principles: relationships at the center, community, and accountability.<sup>13</sup>



Figure 13. MGHSC by Ricardo Kanbarar.

Classrooms, or flexible learning spaces, include moveable walls positioned around common areas for research, projects, interdisciplinary work, and interaction. Also, there are no hallways and stairs are focal points. There is a social common area with a specialized learning center to promote interaction and a sense of community.

<sup>11</sup> Raskin, Laura. "Marysville Getchell High School Campus," 1.

<sup>12</sup> Ibid., p. 2.

<sup>13</sup> Ibid., p. 3.

The superintendent at Marysville School District, Dr. Larry Nyland stated, "When people walk into the building, they say things like, "Wow, what a great place to learn. I wish I would have had the opportunity to go to a school like this. It really invites you in to be a part of the learning process and it has created a new way of being."<sup>14</sup>

Architect Craig Mason stated, "This project was pretty unique, particularly for a public school. The district had actually developed an educational vision well before the architect got involved. It was a whole new way of educating and learning and we from the architectural side wanted to make sure that that was expressed the minute students stepped on campus. Each school is seen as an integrated suite of spaces to foster relationships and collaboration. We wanted every space to be a learning space or a gathering space so there are no corridors. As soon as you step into the building you see learning happening...The district went from a 50% graduation rate to a 57% graduation rate to a 77% graduation rate to an 87% extended graduation rate."<sup>15</sup>

An example of the environment's positive impact on a student was explained in an interview with MGHSC Graduate of the School for the Entrepreneur, Melissa Jones, who stated, "When I first found out we were going to have a brand new school, I was

overwhelmed. I did not know I would be going here yet, but I knew it would bring a lot of change. When I first saw the new campus, I was so surprised about how nice it was...Once I switched to an SLC, it made my performance a lot better and it made me realize that I can do things I didn't think I could do before. It's a lot better than any school I have ever been to."<sup>16</sup>

## **CASE STUDY #2: CRITIQUE OF MARYSVILLE GETCHELL HIGH SCHOOL IN WASHINGTON BY CRAIG MASON AND DLR GROUP (2010)**



*Figure 14. MGHSC by Ricardo Kanbarar.*

MGHSC has created an unquestionable sense of health and wellness, encouraging: physical activity, mental soundness, social stability, and environmental awareness. The individual SLCs promote brief bouts of walking to the Campus Commons. Argumentatively, if the Campus Commons, which contains a gym, dining room, and fitness room did not exist; the separate SLCs could become extremely

<sup>14</sup> "Marysville Getchell," Interviews on ArchRecordTV, accessed May 1, 2013, [http://www.youtube.com/watch?v=ef-YeIvwhOU&feature=player\\_embedded](http://www.youtube.com/watch?v=ef-YeIvwhOU&feature=player_embedded)

<sup>15</sup> Ibid., Web.

<sup>16</sup> Ibid., Web.



segregated from one another. Also, the school does not contain a complete infrastructure, inviting the rest of the community.

However, DLR Group studied and engaged the community and students within the design process, even making ADA a high priority. Former Marysville Student, graduate of Brigham Young University, Shelby Hintz stated, "It's awesome. It does not look like a school. It's very collegic and you know, cool, new, really hip, and I love it."<sup>17</sup> The female student, currently in a wheelchair, mentioned, "During my sophomore year, I talked to the architect because he really wanted to hear what I had to say. As I was touring the campus, I saw a couple of things and began to think 'that was my idea; that's so cool'. I can say I helped design that building; there is a little piece of me in this building."<sup>18</sup> Even in separating the SLCs and creating longer distances of travel to one's SLC and to the community center, comfort for the disabled was not an issue.

MGHSC is an innovative and attractive design, but it would have benefited from designing in light of the *Active Design Guidelines*. The knowledge of their existence could have positively influenced the incorporation of health within the design.

In terms of the importance of physical activity within K-12 students of today, MGHSC's separate SLC's do not require students to continually circulate from building to building,

if the idea is to learn in an individual SLC. MGHSC should have integrated health strategies and encouraged a larger sense of community between the buildings, as well as the surrounding context. MGSHC is a beginning to a possible community solution, encouraging student health, but it still seems to include separate design strategies and separate communities. In order to increase the longevity of it's healthy design, the strategies and communities must connect and interrelate.



DESIGN  
CAN  
CHANGE  
THE WORLD.

Figure 15. *Design Can Change The World* by Jenna Martini.

### **THE IDEAS: DEFINING SPECIFIC DESIGN STRATEGIES PROMOTING HEALTH AND WELLNESS**

It is evident The Active Design Guidelines are a beginning to designing buildings, which promote health and wellness. However, The Active Design Guidelines, similar to LEED are acting like a checklist. The issues are far

<sup>17</sup> Ibid., Web.

<sup>18</sup> Ibid., Web.

more important and are unsolvable by a checklist. Examples, such as The Federal Environmental Agency and The MGHSC, include design strategies promoting health and wellness, which is definitely a beginning. However, the issues require a complete system instead of mere application of individual design strategies. If designed as a complete system, Healthy K-12 Educational Facilities have the potential to promote health of the individual as well as the community.



Figure 16. Whetstone High School. North Façade. Connection to the Olentangy Trail. By Jenna Martini.

**PROPOSED SITE**

The proposed site for the design of a Healthy K-12 Educational Facility is located less than ten miles north of downtown Columbus at a main site in Upper Arlington. It is adjacent to three main highway ramps connecting to 315 North and South, which then connect to 71 and 270.

The North building façade is location along the

active Henderson Road, with a main site connection on the northwest to The Olentangy Trail, one of the most popular greenways in Ohio with a 13.75 mile route from Worthington Hills to downtown Columbus. The Olentangy Trail contains paths for walking, running, and biking along Whetstone High School, The Park of Roses, and The Olentangy River. It also travels through the heart of The Ohio State University campus.

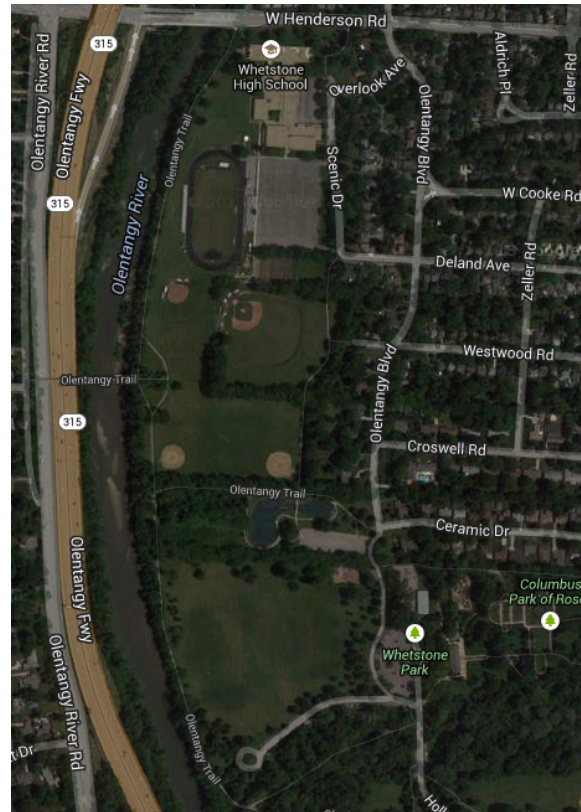


Figure 17. Whetstone High School. Google Images.

The site is twenty-five acres with a one hundred and thirty thousand square foot high school built in 1961. Although the building is in extreme need of a renovation, or a re-build, the site is extremely powerful for integration of a Healthy K-12 Educational Facility,

promoting health of the individual as well as the community. Whetstone High School has a 2-court gym, a baseball field, a football stadium with a wrap-around track, tennis courts, and a soccer field to the south. The learning environment also contains interior gardens and outdoor classrooms. The most appropriate word to describe Whetstone High School and the site is: potential.

Through the utilization of the suitable site and the integration of strategies within a complete system, Whetstone High School has the potential to become the first Healthy K-12 Educational Facility in Columbus, Ohio.

### **A COMPLETE SYSTEM**

Within the design of the first Healthy K-12 Educational Facility, the success lies within the development of a complete system. A *complete system* can be defined as interrelationships working to support a common goal. The common goal is health.

A complete system must maximally utilize the selection of the site, the linking of the site to the building, and the design of the building itself from the project's beginning to end. The three must be carefully and strategically integrated with one another.

Also, a complete system is made up of separate programmatic strategies, which are only integrated into the design if supported by other separate programmatic strategies. One strategy is constantly supported by another strategy. Therefore, even if one relationship

fails, there are others still holding it together.

### **SPECIFIC PROGRAMMATIC STRATEGIES**

For example, the strategy of utilizing the bike can be linked to the site's access to the Olentangy Trail, connection to the neighborhoods, connection to parks, circulation around the building, circulation through the building, bike rental, bike racks, and bike repair shops.

Another example may include, interior and exterior community gardens. Again this may sound simple, but with the proper design development, this example may create a complete system. Interior and exterior gardens can be connected to the landscape, the cafeteria, an outdoor classroom, and a small grocery. It can provide: outdoor physical activity, healthy food consumption, hands-on educational experiences, community engagement, economical growth, and environmental strategies.

The two examples above are strategies, which promote the design of a complete system in order to stimulate health. Complete systems are necessary to the success of a Healthy K-12 Educational Facility.

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Figure 18. *People can change the world* by Brad Meltzer.

## CONCLUSION

Steve Jobs once said, “People who are crazy enough to think they can change the world are the ones who do.”<sup>19</sup> Through the design of a complete system, Healthy K-12 Educational Facilities have the potential to positively influence the health of individuals as well as the community. The complete system can be understood as an umbrella made up of strategies working together through the utilization of site selection, site and building integration, and building design. It is essential that the final designs of Healthy K-12 Educational Facilities contain interwoven strategies. If the design is successful, it will cause a substantial increase in physical activity, mental soundness, social stability, nutritious consumption, and environmental awareness for the individual and the community.

<sup>19</sup> Jobs, Steve, *I, Steve*, (Chicago, IL: Angate Imprint, 2011).

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