STRATEGIC PLAN

HIGH SCHOOL FOR SUSTAINABILITY

DEVELOPED BY COLUMBIA UNIVERSITY
FOR THE NEW YORK CITY DEPARTMENT OF EDUCATION DIVISION OF SCHOOL FACILITIES

Credits

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Preface

This strategic plan is a product of the Workshop in Applied Earth Systems Policy Analysis, a requirement for the Master of Public Administration in Environmental Science and Policy at Columbia University's School of International and Public Affairs. The purpose of the workshop is for groups of students to undertake analytic projects for real-world clients in government and non-profit agencies. In the Spring Semester of 2011, a workshop group of 12 students was charged with the task of developing a strategic plan as the foundation for the creation of a High School for Sustainability on behalf of the Division of School Facilities within the New York City Department of Education. This strategic plan is based on the team's research and makes recommendations for the development of the school and the completion of a successful new school application.

The Master of Public Administration in Environmental Science and Policy program (MPA ESP) is a 12-month program within Columbia University's School of International and Public Affairs. The program combines a hands-on approach to management and policy analysis with a deep understanding of ecological and planetery sciences. Graduates from the program are prepared for leadership organizations and the environmental divisions of private companies.

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Executive Summary

With the launch of PlaNYC in 2007, New York City showed the world that it was ready to transform itself into a model of urban sustainability. At the same time, the New York City Department of Education (DOE) was tasked with promoting the goals of sustainability through a Sustainability Initiative created by its Division of School Facilities (DSF). Sustainability has many complex definitions but can simply be defined as a balanced way of human interaction with the earth that meets the present needs of social, economic and ecological development without compromising the needs of future generations. Innovation and education are necessary drivers for improving quality of life while at the same time decreasing negative impacts on the natural environment. With this in mind, initiatives such as, recycling, energy efficiency and environmental awareness campaigns have been integrated to some extent into the teaching agenda of schools for several years. In recognizing that a more aggressive approach to sustainability is desirable, DSF proposed an ambitious idea to advance the work of its Sustainability Initiative even further: a High School for Sustainability (HSS) to serve as a model of sustainability education in New York City. This strategic report describes how the HSS can open its doors by September 2012 by focusing on 4 overarching goals: Educate, Innovate, Advocate and Create.

EDUCATE – While sustainability is a central theme for the curriculum of the HSS, this report also recognizes the need to achieve 100% graduation rates while preparing students for both college and green careers. The HSS augments the New York City Regents curriculum with sustainability courses that instill the principles of sustainability. Additionally, the HSS provides Career and Technical Education (CTE) instruction and labs, along with research workshops, that use Science, Technology, Engineering and Math (STEM) objectives for bolstering achievement. College preparation classes, as well as mentorships, internships and elective classes, are provided through the formation of educational, funding and strategic partners.

INNOVATE – Given the recent surge in the use of green building design in new schools and the mandate for new municipal buildings to abide by green building rating systems in New York City, the HSS sets itself apart by using its innovative, green features to enhance and reinforce the curriculum. This report identifies many ways that the green design of the HSS is integrated into a standard Regents curriculum. For example, innovative features such as moveable walls made of recycled material decrease materials utilized in construction of the school and encourage student recycling efforts. Additionally, an energy efficiency program promotes sustainable use of energy and inspires student research projects. Smart classroom layout and technology ensure that students obtain instruction in the most effective way as well as have easy access

to the building's green features during the practical and research components of the curriculum. This strategic plan also presents a framework for using food as a sustainability theme to teach students the aspects of national and global food production, food packaging and processing and waste management through hands-on learning. Integrating green building design into the curriculum therefore provides students with several opportunities for practical, experiential and innovative learning that challenges them consistently throughout their high school experience.

ADVOCATE – This report recognizes the need to apply the sustainability lessons learned in the classroom to the local community. The HSS encourages its students to form bonds with community organizations and local environmental advocacy groups. In doing this, the HSS enhances students' ability to partake in group work, embrace stewardship opportunities and transition into leaders in sustainability. Establishing meaningful and mutually beneficial connections within its local community places the HSS at the forefront of sustainability education.

CREATE – Before the visionary design of the school can achieve these goals, DSF must establish a long-term management framework, encompassing at least the next 12 months and, if possible, extending to incorporate the first year of school operations. One of the first necessary tasks of this framework includes completion of DOE's new school application process. A key component of this application is the formation of a strong leadership team for the HSS under the guidance of an experienced, well connected and enthusiastic leader. Additionally, the leader and team must also identify critical partners within and outside DSF. Recommendations made throughout this report prepare DSF to submit a completed application by the fall of 2011. A calendar detailing important dates and milestones is included at the end of the report as it is imperative that these milestones are met for successful opening of the HSS in 2012.

Given the leadership role that DSF has already taken in improving the sustainability of the New York School system, the HSS allows this division of the DOE to take its efforts a step further. The HSS not only assists in improving the objectives of DOE by achieving increased graduation rates and preparing college and career ready students, but it also presents an opportunity for current instruction within city schools to embrace two important ideas:

1. Sustainability curriculum themes bridge the knowledge gap between students and their environment, and
2. Improving education standards through an innovative approach introduces exciting academic challenges for students.

Part 1: Introduction

This strategic plan lays out a vision of how the Division of School Facilities within the DOE will open the doors of a High School for Sustainability (HSS) in September 2012. The high school is focused on the principles of leading current and future generations to a more sustainable future, and establishes a local and national model for the delivery of an integrated sustainability education and the operation of a sustainable school facility. Beyond these core guiding principles, the HSS provides an enriched educational experience that ensures that its students are well-prepared for higher education and rewarding green careers upon graduation.

The Division of School Facilities (DSF) has the immense task of being responsible for the maintenance, repair and safe operation of all facilities under the jurisdiction of New York City's school system – the largest public education system in the United States. DOE serves about 1.1 million students in nearly 1,700 schools, and DSF oversees approximately 130 million square feet of floor space in over 1,237 separate sites throughout the five boroughs of New York.

Since DOE sites represent about 40% of total municipal square footage in New York City, and about 25% of the city's energy bill, DSF also has a key role to play in New York City's overall energy conservation efforts and other environmentally sustainable practices identified in PlaNYC. In 2009, DOE, under the leadership of DSF, became the first New York City agency to benchmark the energy usage of all of its buildings. All other city agencies have since followed suit.

DSF is well-positioned to make an impact on the broader New York City community. In 2009 it launched an innovative and widespread effort called the Sustainability Initiative. The goals of this initiative included doubling the school system's annual recycling by 2013, reducing greenhouse gas emissions by 30% by 2017 from DOE buildings and operations, providing sustainable curriculum resources to principals and teachers, and setting up programs to increase water efficiency. John Shea, Chief Executive Officer of DSF, and Ozgem Ornektekin, Director of Sustainability, currently head the Sustainability Initiative.

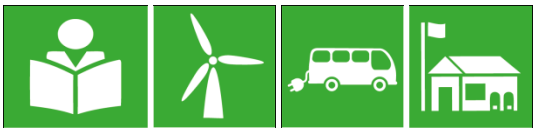
A part of the Initiative, a Sustainability Committee was established, comprised of number of DOE divisions as well as other public organizations. At DOE, the divisions include: School Food, the Compliance Office, Teaching and Learning, Communications and Media Relations, Career and Technology Education, and the School Construction Authority. At the broader governmental and public agency levels, representatives from

the Mayor's Office of Long Term Planning and Sustainability, the Department of Sanitation, the Department of Citywide Administrative Services (Division of Energy Management), the Department of Parks and Recreation, the US Environmental Protection Agency (Region 2), the United Federation of Teachers (Local 891), the Council of School Supervisors and Administrators, Community Education Councils, GrowNYC and the New York Restoration Project complete the Committee. In addition, DOE partners with public and non-profit organizations, including the Earth Institute's Center for Environmental Research and Conservation at Columbia University.

DSF's innovative approach to sustainability has led to the creation of the HSS, the first of its type created by an agency from within DOE. It places DSF at the forefront of thinking and action in the field of sustainability education and practice, and serves as an example for other city agencies not only in New York City, but around the country and the world.

A word about PlaNYC

DOE's Sustainability Initiative supports PlaNYC, the overarching sustainability plan for New York City. Launched on Earth Day (April 22), 2007, PlaNYC outlines 127 initiatives in five key areas of the City's environment: land, air, water, energy and transportation. PlaNYC has become a model for integrated sustainability practices at the municipal level, and positions the City to continue to grow in a sustainable manner over the long term. The Mayor's Office of Long-Term Planning and Sustainability launched PlaNYC 2.0 on April 21, 2011, in celebration of Earth Day 2011.



Part 2: Strategic Goals

Goal 1: EDUCATE

Create a high-achieving school based on a sustainability curriculum that prepares students for green jobs and careers

Augment a standard Regents curriculum, achieve 100% graduation rates within 5 years and prepare students for green careers and higher education through the introduction of sustainability subjects, integration of STEM and CTE principles, and provision of extended learning activities.

Strategy # 1.1
Introduce sustainability subjects into a standard curriculum

Strategy # 1.2
Create a program design that allows different student pathways

Strategy # 1.3
Offer co-curricular opportunities

Strategy # 1.4
Offer extended learning opportunities

Goal 2: INNOVATE

Educate within a sustainable facility

Select and design a physical school space that supports sustainability initiatives and green building principles while also enhancing the learning experience of students.

Strategy # 2.1
Provide a green building space that reflects sustainable practices

Strategy # 2.2
Include innovative and state-of-the-art features

Strategy # 2.3
Use the facility as a learning tool to enhance the curriculum

Goal 3: ADVOCATE

Develop a community-centered school and a school model for sustainability

Develop well-informed, responsible citizens; enable effective, rewarding local partnerships; and provide a model for sustainability across the nation.

Strategy # 3.1
Provide connectivity with the surrounding community, promote environmental stewardship and create responsible citizens

Goal 4: CREATE

Open the High School for Sustainability in September 2012

Introduce the concrete steps DSF must take to open the HSS in September 2012, from the initial steps of the application process through management considerations for ensuring the long-term success of the school.

Strategy # 4.1
Organize a strong and effective leadership team

Strategy # 4.2
Establish critical and engaged partnerships

Strategy # 4.3
Prepare a comprehensive and successful new school application

Strategy# 4.4
Develop metrics for long-term planning and performance management

Mission Statement for the High School for Sustainability

The main purpose of the strategic plan is to open the High School for Sustainability (HSS) by 2012. To do this, the HSS leadership team must first provide a strong vision that embodies the values, business and purpose of the school. The mission statement, a fundamental step in the new school application process represents this vision. The following mission statement is an initial example of what the HSS mission statement might be and was used to inform the recommendations in this strategic plan. This should evolve over time according to the school leader's vision and experience.

HIGH SCHOOL FOR SUSTAINABILITY

The High School for Sustainability fosters a safe and nurturing culture of learning and self-discovery based on an understanding of the interconnectedness of our natural environment, economy and society. Our students graduate prepared for college and careers as committed, responsible citizens who practice sustainability in every aspect of every day.

We accomplish our purpose by providing a challenging, hands-on, visionary educational experience based on sustainability principles, both inside and outside the classroom. Our unique curriculum inspires students to learn, but is also adaptable to student needs. The school's innovative green facility augments the educational experience by providing practical research opportunities. We provide opportunities through our partnerships for students to interact with professionals in their field of interest. Our high school has a faculty and staff that embody our values and act as stewards of sustainability.

Above all we value respect for the environment and stand by the three pillars of sustainability – environment, equity and economics. We believe in experiential, project-based learning, and community engagement. We are open to improvement and committed to problem solving. We value the needs of our students and their development as conscientious citizens who consider the needs of future generations.

Part 3: Designing the Curriculum of the High School for Sustainability

Goal 1: EDUCATE

Create a high-achieving school based on a sustainability curriculum that prepares students for green jobs and careers

An important aspect of the strategic plan is to provide DSF with a comprehensive overview of ways in which sustainability principles can augment the current educational experience of a student in New York City and satisfy the objectives of preparing students for higher education and a green career.

Sustainability themes guide the instructional vision of the HSS. Through a dynamic and innovative curriculum and a wide variety of co-curricular and extended learning opportunities, students learn not only the required New York State core standards, but also gain the essential knowledge and skills needed to meet the sustainability challenges of the future.

However, as important as the sustainability theme might be the ultimate success of the school depends on how well it prepares students for life after high school. This success can be measured in two areas: preparation for college, and preparation for jobs in the green economy. For this reason, the HSS curriculum is designed to provide a rigorous, relevant and hands-on educational experience that graduates students on time with the skills they need to move forward.

The State of Education in New York City

As with any public education system, DOE is faced with the major challenges of achieving high test scores and increased graduation rates among its students. Providing access to high-quality schools, such as the HSS, for all students is a major component of facing these challenges.

New York City has seen an increase in graduation rates in recent years, rising more than 33 percentage points between 2002 and 2009 to its current level of 63% (DOE, 2011r). Over the last six years, DOE has been successful in decreasing the dropout rate by more than 10 percentage points. Less than 60% of minority students graduated from high school

in 2009, compared to nearly 80% of Asian and white students (DOE, 2011r). High-quality schools for traditionally underserved populations remain a priority.

Yet simply focusing on graduation rates is not enough – the true challenge of a high school education is making graduation mean something. A recent study shows that only 23% of students in New York City graduated ready for college or careers in 2009, not counting special-education students (Otterman, 2011).

Determining college readiness itself remains a challenge. Traditionally, college readiness has been defined primarily in terms of high school courses taken and grades received, along with scores on national tests. These metrics become problematic when, in New York City, 75% of students who graduate from public high schools and then enroll in community colleges still need to take remedial math or English courses before they can begin college-level work (Otterman, 2011). Therefore, college readiness is better defined as the level of preparation a student needs in order to enroll and succeed, without remediation, in an entry-level general education university course (Conley, 2007). Under this definition, it is assumed that students who are able to succeed in entry-level courses will be able to cope with the full range of college courses they are likely to encounter.

Many of the factors that are necessary to prepare high school graduates for success in college are the same ones necessary for success in transitioning to well-paying jobs in the green economy. Surveys consistently show that many high school graduates do not meet employers' standards in a variety of employability skills, such as attendance, teamwork and collaboration, and work habits (Bangser, 2008). Nor are students graduating with the required set of technical and vocational skills needed for success in the expanding green jobs market. Opportunities exist to better incorporate Career and Technical Education (CTE) and other jobs-focused content into the high school experience. In the economy of the 21st century, careers will require standard high school curricula to be supplemented by on-the-job training, internships and apprenticeships.

The HSS curriculum addresses these challenges.

NYS Standards and Regents Exams

The HSS curriculum is required to incorporate the New York State Learning Standards and core curriculum that clearly lay out what students are expected to learn across a variety of subjects throughout the state. The current NYS standards span all grade levels, from Kindergarten through 12th grade. Elementary and middle school students take yearly State tests in core academic subjects to

assess their mastery of the State Standards, and schools use the results of these tests as one of the factors in determining whether to promote a student to the next grade.

In high school, DOE uses Regents Exams to assess mastery of the Standards. In order to receive a high school diploma, a student must attain a score of 65 or higher on a series of five Regents Exams.

- Mathematics
- Global History
- US History and Government
- English
- Science (may include Earth Science, Physics, Biology, Chemistry)

Students may also receive an Advanced Regents Diploma, which requires additional science, math, and foreign language Regents Exams (NYSED, 2011c).

All public schools must use some form of assessment to test students, with most opting to use Regents Exams. Some schools choose alternative assessment methods, such as reviewing a student's work in a portfolio examination. In this case, each student gathers his or her most successful projects from each subject and presents them to a panel of teachers to display competency in the core subjects. If the portfolio is deemed sufficient, the student receives a Regents Equivalency Diploma. The schools that opt for this route are typically charter schools, as well as a small number of consortium schools, which opt out of all Regents Exams except for English. Additionally, students may be exempt from taking the Regents Exam for a particular subject by passing the equivalent Advanced Placement (AP) Exam.

In 2010, New York State also adopted the Common Core State Standards (Standards), a list of national standards developed by the National Governors Association and the Council of Chief State School Officers. The Standards clearly lay out a consistent set of English language arts and

Importance of CTE

Career and Technical Education (CTE), prepares students with workforce skills in specific career pathways while meeting core standard requirements and preparing students to receive a Regents Diploma with a Technical Endorsement.

Within NYS, over 1 million students participate in CTE courses, with related content in areas such as

- Agricultural Education;
- Technology Education; and
- Trade, Technical, and Industrial Education (NYS STEM, n.d.).

These skills lead to postsecondary education or further industry training. Although many schools are specifically classified as CTE schools, a school can also integrate elements of CTE within a larger curriculum.

The HSS curriculum integrates coursework with work-based learning experiences and provides a wider range of technical and vocational skills and career opportunities (ACTE, n.d.).

mathematics expectations that students need to meet in order to succeed in college and careers. Although adoption is optional, over forty states and the District of Columbia had adopted the Standards through February 2011 (CCSSI, 2010). The Standards supplement and enhance the New York State-specific Learning Standards and core curriculum.

In order to support achievement in the Standards, New York State joined the Partnership for Assessment of Readiness for College and Careers (PARCC). The goal of PARCC is to develop a common set of K-12 assessments in the Common Core standards of English and math, anchored in what it takes to be ready for college and careers. Students who score proficient on the PARCC assessments know they are on track for the next steps in their education, and send an early signal whether they are ready for entry-level, non-remedial courses in college. Technology is central to the PARCC assessment system, relying primarily on computer-based modules that produce real-time snapshots of students' knowledge. Field testing and data collection for the PARCC assessment process are to continue through 2013, with the first assessments administered in all PARCC states by the 2013-2014 school year (PARCC, 2011).

Variability in Performance Testing

Consortium schools forgo examination-based assessments in favor of "a system of performance-based assessment," allowing for exemptions from all Regents Exams except English (NY Performance Standards Consortium, 2003). These exams are replaced with a portfolio that a student creates throughout his or her high school career, presenting this work to a panel of teachers who then judge the work and deem it acceptable for graduation. This system frees teachers from "teaching to the test" and allows students to explore individual interests (Regina Chen, personal interview, February 18, 2011). However, the effectiveness of this type of assessment can be very inconsistent among individual students, as it is difficult to surmise from a small sampling of projects and papers whether a student really possesses a broad range of knowledge on each subject matter (Regina Chen, personal interview, February 18, 2011). Nevertheless, consortiums remain an option for further consideration and research, since they do offer the possibility of additional flexibility and multi-subject integration.

The HSS uses the Regents Exams as a basis for performance testing and one of the factors in determining the overall effectiveness of the school's curriculum and program design.

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Curriculum

Strategy # 1.1: Create a program design that allows for different student pathways

Pathway Choices

A curriculum designed on a two-track system differentiates students into two separate tracks: one track prepares students for higher education while the other prepares students for careers in a skilled trade. Students within the career track are still required to obtain a Regents Diploma, and so must take all of the same core classes, but the two-track system allows for diversity especially within the elective courses. College-bound students typically pursue a more wide-ranging liberal arts education while those on the career track focus on utilitarian and vocational courses and training (NYSED, 2011c).

Whether the two-track system benefits students is up for debate. Some NYC schools have integrated track-type teaching into their curricula to varying degrees. Rockaway School in Queens implements a two-track system similar in design to the program of the HSS. Those that oppose the two-track system contend that all students should receive the same core education and move on to a more specified learning path after receiving a well-rounded and open education during high school. The Urban Assembly School for Green Careers (UASGC) in New York City promotes a pathway choice system (Alexandra J. Rathmann-Noonan, personal interview, March 17, 2011).

The curriculum of the HSS is based on a modified two-track system. All students enter 9th grade along undifferentiated pathways, but can later focus on individual interests by 11th grade. College-bound students may, for example, take additional AP and foreign language courses to better prepare them for higher education, while others choose to take CTE courses to better prepare them for green careers. However, college education itself is increasingly becoming an important part of the preparation for a green career. Therefore, it is a goal of the HSS to prepare each and every student with the option of going to college, keeping in mind that some may choose to directly enter the workforce.

Table 3-A: Fitting Sustainability Education into a Standard 8-Period Day

In order to develop a curriculum for the High School for sustainability, the sustainability curriculum needs to fit into an eight period, eight-course school day. The below matrix demonstrates how all of the sustainability curriculum topics will fit into the eight period school day. A check mark indicates that the sustainability topic will be taught in that class.

	1	2	3	4	5	6	7	8
	English	Social Studies	Math	Science	Language/ Cultural Studies	PE/ Health/ Nutrition	Sustainability	Elective
Water/Hydrology				✓			✓	
Environmental Chemistry				✓		✓	✓	✓
Climatology				✓			✓	✓
Ecology/Diversity of Life/Biodiversity		✓		✓			✓	
Interconnectedness	✓	✓		✓	✓	✓	✓	✓
Climate Change	✓	✓	✓	✓		✓	✓	✓
Sustainable Energy		✓	✓	✓			✓	✓
Sustainable Agriculture/Food Production	✓	✓	✓	✓	✓	✓	✓	✓
Waste / Consumer Goods		✓	✓	✓			✓	✓
Energy Efficiency/Green buildings/ Green architecture		✓	✓	✓			✓	✓
Transportation	✓	✓	✓	✓			✓	✓
Environmental Policy/Government Legislation	✓	✓					✓	
Corporate Sustainability Efforts		✓					✓	
Ethics and Values	✓	✓					✓	

All of the sustainability subjects will be incorporated with the eight-course school day. Each course will require a scope and sequence to ensure that students graduate. The scope and sequence for each course is listed in Table 3-B, on the following page.

Table 3-B: Scope and Sequence for the High School for Sustainability

	1	2	3	4	5	6	7	8
	English	**Social Studies**	**Math**	**Science**	**Language/ CTE**	**PE/ Health/ Nutrition**	**Sustainability**	**Elective**
Grade 9	Regents English	Global Studies	Algebra	Living Environment Regents	Foreign language	PE/ Health/ Nutrition	Sustainable Energy and Climate Change Sustainability Seminar	Art/ Music/ Media
Grade 10	Regents English	Global Studies	Geometry	Chemistry Chemistry / Advanced Chemistry	Foreign language	PE/ Health/ Nutrition	Sustainable Agriculture and Biodiversity Research Workshop	Student Choice
Grade 11	Regents English	U.S. History I and II	Algebra II / Trigonometry	Earth Science Earth Science / Advanced Earth Science	Foreign language (Cultural Studies/ Alternative Studies) / CTE I	PE/ Health/ Nutrition	Sustainable Water Systems and Waste Research Workshop / CTE Workshop	Student Choice
Grade 12	Senior Writing Seminar	Government	Calculus or Stats	Physics Physics / Advanced Physics	Foreign language (Cultural Studies/ Alternative Studies) / CTE II	PE/ Health/ Nutrition	Sustainable Cities and Corporations Research Workshop / CTE Workshop	Internship

Curriculum Structure

Strategy # 1.2: Introduce sustainability subjects into a standard curriculum

Daily Class Schedule

The HSS curriculum is based on a period schedule, in which a student generally takes eight separate classes each day. However, it introduces the element of block scheduling as well. At the HSS, students take all eight classes Monday through Wednesday, but only four on Thursday and the other four on Friday. In this way, each subject receives a double-block to work on projects, complete labs, or do group work.

English, Social Studies & Math

NYS requires that high school students take four years of these classes and pass the English, Social Studies and Math Regents to receive a Regents diploma. The scope and sequence for the HSS remains similar to the standard scope and sequence for New York State High Schools. Classes are enriched with various sustainability subjects where possible and as appropriate. See table 3-B.

Science

The science curriculum at the HSS is rigorous. Four years of science courses, in Living Environment, Chemistry, Earth Science, and Physics, is required. These courses teach the scientific method and quantitative techniques. Rigorous science also prepares students for the SAT or ACT standardized tests. Students will take the Living Environment Regents test in order to get their high school diploma in NYS.

Science courses are tiered following freshman year after all students take the Living Environment requirement. Based on performance in Living Environment, teacher input, and student feedback, students are placed into either Chemistry or Advanced Chemistry in tenth grade. Following performance in Chemistry or Advanced Chemistry, students are placed in Earth Science or Advance Earth Science in eleventh grade. The same process continues with placement in either Physics or Advanced Physics in the senior year. At each level of science, a student moves from the standard level into the advanced class or from the advanced class into the standard. This flexibility is the most effective way to ensure student achievement in completing the science scope and sequence.

Language/Cultural Studies/Alternative Studies

NYS requires a minimum two years of foreign language study. In recognition of the fact that not all students have the same level of achievement or interest in studying a foreign language, after two years of required language courses students have the option to pursue alternative subjects such as: Cultural

Studies, Ethics and Engineering labs in their junior and senior years.

Students who would like to pursue a technical green career are required to take the two years of mandatory language courses and then take CTE courses in their junior and senior years. The CTE courses train students in the green career track to work right out of high school.

Physical Education/Health/Nutrition

NYS requires that students take four years of Physical Education. At the HSS, students take four years of Physical Education, including lessons in Nutrition and Health. Sustainability topics are incorporated as appropriate, especially with regards to sustainable food production.

Elective

Students are required to take an Art, Music, or Media elective during their freshman year. This elective is a part of the suggested curriculum because it greatly contributes to the creation of well-rounded students with the ability to explore a variety of interests. A possible outcome of the Media elective includes student-produced videos or multimedia presentations on topics related to sustainability. After their freshman year, students choose different electives for their sophomore and junior years. Finally, as seniors, students are required to complete an internship with an outside partner. The internship serves as the capstone experience for students at the HSS, allowing them to enhance their skills and experience in a real-world situation.

Electives taught at the HSS are determined by teachers' interest and capabilities. Electives may include topics from the following list.

- Recycling
- Carbon Markets/Environmental Markets
- Renewable Energy Finance
- Green Building Operations
- Green Chemistry
- Supply Chain Management
- Public Health Impacts of Climate Change
- Sustainable Economic Development
- Climate Change Law
- Water, Waste and Energy Management
- Solar Panel Design and Installation

Sustainability

The curriculum for the HSS includes a Sustainability scope and sequence so that students have a 45-minute period of sustainability education each day for all four years of high school. This Sustainability scope and sequence is intended to teach students about the topics of sustainability above and beyond simply studying earth sciences. The scope and sequence focuses on human interaction with the earth and is broken into four courses.

9th Grade
Sustainable Energy and Climate Change

Students learn how energy is generated in the United States and in other countries and the differences between fossil fuel generated electricity and renewable energy. Additionally, the course covers lessons on "smart grids," energy efficiency, transportation fuels, petroleum oil and biofuels.

10th Grade – Sustainable Agriculture and Biodiversity

Students spend the first half of the year learning about sustainable agriculture practices and the second half of the year learning about biodiversity and ecological sustainability. In the agriculture section, students learn how agriculture has evolved over time, how modern agriculture has affected the environment (including the diversity of animal and plant species), and the challenges of feeding a growing worldwide population. In the biodiversity and ecology section, students expand on the principles of evolution and learn about biodiversity and ecology on the planet. Students learn about species extinction and human efforts to conserve biodiversity.

11th Grade – Sustainable Water Systems and Waste

Students spend the first half of the year expanding on the principles of hydrology and learning about modern water use in the U.S. and around the globe. Students examine how water flows into large cities like New York City and about wastewater treatment practices. In the second half of the year, students learn the various ways of dealing with waste, including innovative waste-to-energy plants. This course includes a thorough examination of the life-cycle of products in the materials economy: how consumer goods are manufactured, distributed, consumed, and then disposed.

12th Grade – Sustainable Cities and Corporations

Lessons on sustainable urban design and sustainable business practices round out the sustainability curriculum. When focusing on urban areas, students study large cities like New York, and also learn about the effects of suburbanization and sprawl. Students research the efforts made by cities on ways to become more sustainable, and also learn how cities are positioned at the center of efforts to design a more sustainable future. Instruction in this course also examines PlaNYC and provides lessons on ways in which corporations and businesses in the U.S. and globally are making their business practices more sustainable.

The 3 Pillars of a Sustainability Education

An education in sustainability at the high school level requires attention to three main themes: **1) the earth system; 2) human impact and sustainability challenges; and 3) human efforts to date.** This framework allows students to understand the earth's sustainable state, how humans have altered this state, and what humans are doing to reduce their impact. The MPA ESP program influenced these themes. The list below outlines 15 key topic areas that provide HSS students with a well-rounded understanding of sustainability; these can be integrated into courses such as Chemistry, Biology, Government, etc. See Appendix 1 for full descriptions of each topic area.

The Earth System

- Water/Hydrology
- Environmental Chemistry
- Climatology
- Ecology/ Biodiversity
- Interconnectedness

Human Impact

- Climate Change
- Sustainable Energy
- Agriculture
- Waste
- Toxic Substances
- Green Buildings
- Transportation

Human Efforts

- Environmental Policy/Government Legislation
- Corporate Sustainability Efforts
- Ethics and Value

What is Sustainability?

Sustainability is a balanced way of human interaction with the earth that meets present needs of social, economic, and ecological development without compromising the needs of future generations.

Some of the key concepts and themes of sustainability include:

- The three E's: equity, environment, and economics;
- Present and future needs;
- Responsible citizenship;
- Interrelationships and balance;
- Human patterns in harmony with the natural world;
- Striving/ongoing process;
- Impact of human actions on future generations; and
- Restoring ecosystem health

Co-Curricular and Extended Learning

The Need for Innovation

In order to provide for a well-rounded and integrated sustainability education that successfully prepares students for both college and green careers, the in-class curriculum of the HSS is augmented with a wide array of co-curricular and extended learning opportunities outside the classroom, including research workshops, internships, mentorships, and community service – all supported by collaborations with strategic partners.

Co-Curricular Learning

Strategy # 1.3: Offer co-curricular opportunities through integration of STEM principles and incorporation of CTE opportunities

A unique aspect of the curriculum at the HSS is the Sustainability Research Workshop, which supports the dual goals of preparation for college and preparation for green careers. These co-curricular workshops provide students with opportunities to begin work on individualized research projects related to their personal academic interests as early as 10th grade. The research subjects can be tailored to fit student pathways. For example, students pursuing more technical career pathways in preparation for green jobs are able to undertake research projects that emphasize and reinforce their trade skills.

Students begin to think about the topics for their research projects as early as the 9th grade, and carry them through over the length of their entire high school career. Not only do these workshops augment the sustainability subjects being taught in other courses, but also students become invested in their work, providing a sense of ownership and commitment that lasts until graduation.

An important aspect of the workshop component of the curriculum is to adopt Science, Technology, Engineering and Math (STEM) and CTE principles in fostering an interdisciplinary approach to performing research. Additionally, the workshops provide opportunities for students from various pathways to collaborate on related projects. The HSS curriculum breaks up the Sustainability Research Workshop into two components: the Research Workshop and the CTE Workshop. Those students pursuing CTE instead in 11th and 12th grades are required to take the CTE workshop component of the Sustainability Research Workshop. (See Table 3-B.)

Importance of STEM and STEM ICT

There has been growing concern among the public, the business community and policymakers that U.S. high school students are ill-prepared to compete on the international level, especially falling behind other countries in the fields of science and technology. To help close the gap, STEM, which stands for **Science, Technology, Engineering and Math,** as well as ICT, **Information and Communication Technology**, are programs meant to provide more rigorous standards in these subject areas.

Although STEM is being encouraged at the federal level, many states have yet to implement STEM curricula due to challenges in converging STEM standards with current state standards. One organization called Mobilizing STEM Education for a Sustainable Future has begun research and development in the field of employing STEM education in five states: Maine, California, Colorado, New Mexico and Maryland (Mobilizing STEM, n.d.). The organization plans on using these states as case studies for the future deployment of STEM curricula nationwide.

An NYS organization called the NYS STEM Education Collaborative is trying to integrate STEM within curricula, although there seems to have been little movement on this front, as only two schools (the Bronx Bridges High School and the Banana Kelly High School) within New York City claim to explicitly follow STEM standards (NYS STEM, n.d.). Therefore, even though STEM and STEM ICT are desirable attributes to include in a school program, the rigidity of current standards makes it challenging to fully integrate STEM into a school curriculum.

Nevertheless, the HSS curriculum acknowledges the importance of STEM, and provides high levels of math and science instruction as well as substantial technical career training. The HSS curriculum is closely aligned with the goals of STEM in order to best prepare students for college and careers upon graduation.

Sustainability Research Workshops

9th Grade – Sustainability Seminar (SS)

All students receive the same introductory course in sustainability in the Sustainability Seminar. At this point students do not need to know which pathway they would like to pursue. However, if students are interested in one direction over the other as early as 9th grade, then co-curricular and extended learning activities allow them the opportunity to explore these interests early on. Additionally, the Sustainability Seminar is augmented with activities such as guest lecturers and field trips.

10th Grade – Sustainability Research Workshop (P1)

Phase 1 of the Sustainability Research Workshop begins in 10th grade. At this point students start to have an idea of the pathway they would like to pursue and a range of research projects is provided. Students begin researching possible topics, of interest, begin to investigate the background of their projects, and perform literature reviews. Partnerships with appropriate collaborators are established. Students work on these research projects for the next two years.

11th Grade – Sustainability Research Workshop (P2)

In Phase 2 of the Sustainability Research Workshop, students begin to delve more deeply into their projects. This phase provides the opportunity for students to increase their data collection efforts or, in the case of students pursuing a particular green jobs pathway, practice elements of technical design. This phase also marks the point in the curriculum where students decide whether to continue foreign language study or take the CTE workshop.

12th Grade – Sustainability Research Workshop (P3)

The final phase of the Sustainability Workshop brings students to the completion of their research projects. This phase might involve analysis for projects relying heavily on data, or design application for projects geared more towards trade skills. Prior to graduation, as one of the highlights of the school year, students present formal research papers or project demonstrations along with poster presentations to an audience of fellow students, faculty, parents and partners.

Bronx Design and Construction Academy

The **Bronx Design and Construction Academy** (BDCA) in New York is an example of where CTE is injected into a standard curriculum. Students, as part of a curriculum on Environmental Sustainability, are taught the following CTE fields: Electrical Technology Construction, Carpentry, Plumbing, HVAC and Architectural Design. At the end of high school, the students receive a high school education focused in aspects of sustainability and a certified CTE diploma (BDCA, 2011). BDCA partners with local construction companies.

Extended Learning

Strategy # 1.4: Offer extended learning opportunities

Innovative education at the HSS does not just end with the Sustainability Research Workshop and selected electives, but encompasses additional extra-curricular learning activities that allow students to augment their in-class curriculum with practical activities such as the following.

- Career development in the form of Mentorships / Internships and Job Shadowing and
- Outdoor education in the form of Community Outreach, After-school / Summer Programs and Sustainability clubs.

Internships and mentorships are essential for students wishing to pursue either higher education or green jobs, and provide students with the opportunity to either build on subjects taught at the HSS or independently pursue new topics of interest. Internships and mentorships are a great way for students to work alongside professionals within their fields of interest, and allow students to experience the practical application of their education in the real world. Additionally, job-shadowing and career development provide essential on-the job skills for students.

Outdoor education and community outreach activities are offered after school or during the summer. These activities are an important element in building strong bonds between the HSS and the local community. Students integrate their learning and apply sustainability principles into the needs of the local community.

Partnerships with local organizations are crucial for the successful development and implementation of co-curricular and extended learning opportunities. Both the Urban Assembly for Green Careers and the High School for Environmental Studies (HSES) in New York City, for example, supplement their students' educational experience with the assistance of a large network of partners (See Appendix XI-B).

HSES also has a number of practical, interactive programs for augmented learning listed below.

- Career Development Program
- Environmental Internship Program
- Career Links in the Classroom
- Green pathways (partnered with University of Vermont)

Green Partners is a Field Education Program whose components include: a Hiking Club, Recycling Club and the "Go Green" Initiative (GGI), "a national campus-based K-12 environmental service program, geared to improve the environmental performance of the

institution while promoting learning and community-building" (HSES, 2011).

The Environmental Charter High School based in California, similarly to HSES, also augments a standard curriculum with the programs listed below.

- Outdoor Education
- After-School Program and creation of clubs
- Extended Learning Program that involves providing college-level courses Summer School, Online Courses, Internships (ECHS Internship Seminar), Job Shadowing and Community Services (CHS, 2011).
- Green Ambassadors Program which is "an online green education project management website platform used by the Green Ambassadors to bring the most innovative, community based, environmentally conscious learning to high school students" (Gambassa, 2011).

Educational Partnerships

Potential partnerships to assist students in preparation for higher education are research organizations, graduate and undergraduate research institutions, and companies focused on innovative sustainability research. Additionally, local, state and government bodies involved in sustainability research would be great assets, as well as international organizations based in New York City that would support an exchange of ideas and teach the benefits of cooperation and information sharing in targeting large-scale global problems.

Partnerships with local green contractors, architects and designers, as well as organizations such as the U.S. Green Building Council, PlaNYC, and perhaps with other CTE high schools, are necessary in allowing for a more interactive approach to teaching CTE principles. Appendix II describes some potential partners that can provide co-curricular and extended learning opportunities.

Training Students for Green Jobs

According to the Bureau of Labor Statistics, green jobs fit into two categories:

- Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources, and
- Jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources (US BLS, 2011).

In his 2011 State of the Union address, President Barack Obama emphasized the vital importance of the green economy as an investment for the U.S. that will "strengthen our security, protect our planet, and create countless new jobs for our people" (ABCNews.com, 2011). By that point, the American Recovery and Reinvestment Act of 2009 had funneled $93 billion to green economic activities, creating or saving approximately 997,000 jobs and boosting gross domestic product by $146 billion (Walsh et al., pg19). The prioritization of green jobs at the highest office of the U.S. suggests that employer demand for green job skills will be on the rise in the future.

Some studies suggest that the market for green jobs has already been growing for some time. According to the Pew Charitable Trusts, green jobs grew between 1998 and 2007 at a rate of 9.1% while the rest of the economy grew at only 3.7% (Pew, 2009). A study commissioned by the U.S. Green Building Council found that green construction projects had created 2.4 million American jobs between 2000 and 2008. They also found that green jobs would create an additional 7.9 million jobs between 2009 and 2013, contributing $554 billion to the U.S. gross domestic product (Stern, 2010). These trends come at a time when experienced professionals in the field identified the need for new people to enter the ranks. According to a survey conducted in 2010 by the Association of Energy Engineers, 37% of the surveyed energy professionals plan to retire in the next ten years, and 61% indicated a heightened shortage of qualified professionals in the green jobs industry (AEE 2010).

However, the picture is still evolving on the true potential for a green economy. Certain segments of today's green economy are growing at a faster rate than others, and the skills that are needed to thrive today may not be as important tomorrow. Growth in green jobs is not uniform across all states either. New York, in fact, experienced a 1.9% decline in clean job growth between 1998 and 2007 (Pew, 2009).

Therefore, while one of the primary goals of the HSS is to prepare the next generation of green jobs professionals, it is important to remember that a solid foundation is the key, and training must focus first on the traditional construction trades, such as electricians, carpenters, and plumbers, rather than specialized "green" occupations such as energy auditors and solar panel installers. Providing students with traditional skills and enhancing those skills with additional green applications and certifications positions them for future success.

Part 4: Designing a Sustainable School

***Goal 2:* INNOVATE**
Educate within a sustainable facility

A Sustainable Facility

While curriculum is an important defining characteristic of any school, the school's interior and exterior environments are integral to the experience and success of the students. For this reason, DSF should devote ample attention to developing a sustainable facility for the HSS that also serves as a learning tool for illustrating concepts in sustainability education and carrying out the New York City's sustainability initiatives. There has been an increased push for sustainable school design, also referred to as "green" or "high performance" facilities. The U.S. Green Building Council (USGBC) offers us this working definition of a green school: **"**a school building or facility that creates a healthy environment that is conducive to learning while saving energy, resources and money" (USGBC, 2008).

By integrating the green design of the school into the educational experience of the students, the HSS sets itself apart from other environmentally themed schools in New York City. Additionally, it allows students the opportunity to experience practical, hands-on learning where they are exposed to sustainability lessons that can be applied to careers following high school. Housing the school within a green, high-performance building inspires students to want to learn, and engage in community outreach projects where research within their green school has the potential to positively impact the local community.

Moreover, a green facility offers opportunities for students to engage in challenging, far-reaching research projects and establish helpful, relevant partnerships that supplement their sustainability education and prepares them to pursue a higher education. A green school achieves the main goals of the HSS and provides students an exciting learning experience within an innovative space.

It is reasonable to expect that the HSS will occupy an incubator space for its first two years then move to a permanent facility as securing an existing green school building, due to availability constraints, is not anticipated. Thus within the first two years, partnerships with green architectural firms and businesses,

such as the Urban Green Council, are essential to allow for augmented, practical instruction via elective courses and/or mentorships and internships to teach green building design.

Green Schools Guidelines

Strategy # 2.1: Provide a green building space that reflects sustainable practices

The USGBC has developed LEED, or Leadership in Energy and Environmental Design, the world's most rigorous and comprehensive rating system for sustainable building design to date. New York Local Law 86/05 (LL86/05) stipulates that all New York City funded new schools and substantial reconstruction projects be "designed and constructed to comply with green building standards not less stringent than standards to achieve a LEED certified or higher rating," (NYC DOE, 2009c).

The LEED for Schools guidelines build upon traditional LEED standards to address issues specific to school spaces and children's health, such as, classroom acoustics, master planning, mold prevention and environmental site assessment (USGBC, 2011a). These guidelines should serve as the primary source of reference for DSF. The comprehensive set of guidelines is available at www.usgbc.org. For the design phase of the HSS, a complete checklist of LEED for Schools credits is provided for reference in Appendices III and IV.

School Construction Authority

The School Construction Authority (SCA) is responsible for the management of the design and construction of new schools and renovation of capital projects in the New York City school system. Their mission is founded on the principles of safety, quality, integrity, cost-effectiveness, environmental soundness and modernity. Using the Green Schools Guide, SCA has included sustainability principles and innovative green features in the renovation of already established schools and the design of new schools. Current green school building projects managed by the SCA include a 26-classroom, 5-story sustainable and eco-friendly school, designed to meet Silver LEED certification in, Hunters Point South, Long Island City, Queens; and P.S. 62, a net-zero energy, 444-seat, 2-story elementary school in Southern Staten Island (NYC DEP "SCA", 2011, Inhabitant NYC, 2011).

Additional pertinent resources for sustainable school design practices include the New York City Green Schools Guide developed by the School Construction Authority (SCA) and the Department of Energy's EnergySmart Schools. The NYC Green Schools Guide, based on criteria established by the New York Collaborative for High Performance Schools (NY-CHPS), was originally developed by the SCA to guide the sustainable design, construction and operation of new schools, modernization projects and school renovations (CHPS, 2010). The Green Schools Guide includes standards

specifically designed for school buildings in New York City. The EnergySmart Schools website provides straightforward information on energy and resource efficient standards and practices for schools across the country, as well as a good deal of resources for planning, financing, designing, building, and operating a high-performance school, which can lower a school district's operating costs by 30% (U.S. DOE EERE, 2009a).

The LEED for Schools standards apply to design and construction activities for both new school buildings and major renovations. A project seeking LEED certification must first register with the Green Building Certification Institute (GBCI) (GBCI, 2011). In order to earn LEED certification, the project must satisfy all Minimum Program Requirements (MPRs) and qualify for a minimum number of credit points attached to the desired rating. A small number of bonus credits are also offered. Projects must adhere to the MPRs and specific topic credits that are detailed in the version of LEED for Schools. These credits should be current at the time of project registration.

Topics addressed in green building guidelines, such as LEED Green Building Rating Systems and the NYC Green Schools Guide, include:

- Sustainable Sites;
- Water Efficiency;
- Energy and Atmosphere;
- Materials and Resources;
- Indoor Environmental Quality; and
- Additional Credits.

School Location

Space in New York City is at a premium, so securing a suitable location presents a challenge for the HSS. Therefore, the incubator space and the permanent facility would present the chance for school leadership, partners, and students to:

- Convert a **current LEED building** to a LEED-certified school; or
- Convert a **current school building** to a LEED-certified school.

Converting a current LEED building to a LEED school is one option for choosing a site for the HSS. The primary contender identified at this time is the LEED Platinum Bank of America building at One Bryant Park in Midtown Manhattan.

Once potential sites are identified, either through DOE or from outside partnerships, assessment of the best candidates by the HSS leadership team should occur. This report recommends cultivating relationships as early as possible with potential facility partners, as DSF has done with USGBC. This allows more influence over the final choice by providing options outside of the DOE system. The leadership team should consider elements in the following paragraphs when selecting a location for the HSS.

School Search Tool

The school search tool on the DOE's website provides results based on a variety of searchable criteria, including geographic location and keywords found in the high school's name. Once established, the HSS will also appear in the search results. While selecting a location for the HSS, DSF should also consider how the school appears on the school search map relative to other high schools, while still considering accessibility to public transit. Map 1 shows the results of a cursory school search for existing environmentally themed high schools in New York City using the school search tool.

Alternative Transportation

LEED for Schools emphasizes the importance of alternative transportation and access to mass transit lines. The HSS should minimize contributions to pollution and land development impacts by choosing a site that is easily accessible to several alternative transportation options, including trains, buses, pedestrian walkways, bicycle routes, and rideshares. More detailed guidance on alternative transportation options is available from USGBC. LEED guidelines stipulates that an ideal location for the HSS would be within ½-mile walking distance to a subway, commuter rail, or light rail station, within ¼-mile walking distance from two or more public bus lines, and within 1 ½-mile walking distance of residences of 80% of the anticipated student population. Parking capacity should also be considered in the siting process and efforts made to minimize parking lot or garage size, and to provide 5% preferred parking for high occupancy vehicles and 5% preferred parking for low-emission, fuel-efficient vehicles.

Map 2 shows the proximity of current NYC high schools to subway stations. Most schools are located within 1/8 to ¼ of a mile to subway stations though there are several that are located within ½ to one mile proximity of the subway. Appendix V has further description of these maps.

Map 1: **Results of a Search for Environmentally Themed High Schools in New York City Using the DOE's Search Tool.**

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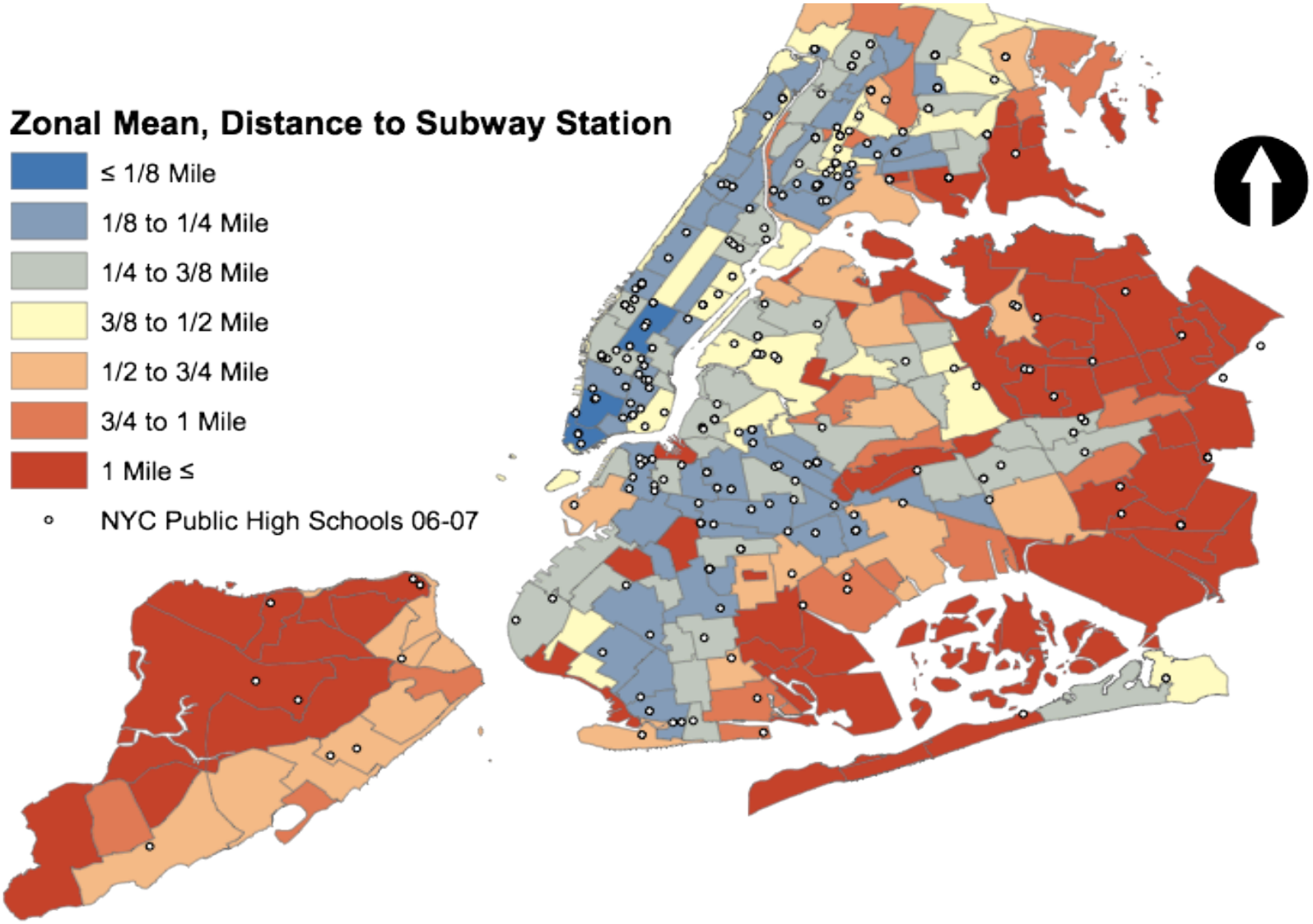
Data Source: *NYC Department of City Planning / New York City Department of Education*

Map 2: Proximity of Public High Schools to Subway in New York City



Data Source: *NYC Department of City Planning / New York City Department of Education*

Community Connectivity

Community involvement is a central idea in the vision for the HSS. The leadership team should research community engagement opportunities available near each candidate site, and include this analysis in its decision.

Sharing Space

In the event that the HSS shares a facility either with other schools in an educational complex, or in a mixed commercial use space, school leaders need to work closely with the leaders of the shared institutions. This ensures that projects involving common spaces do not interfere with the activities or requirements of the other occupants, and that they are mutually beneficial to all parties whenever possible. For example, if the HSS shares an educational complex with two other schools, HSS leaders can engage the leadership teams of the two other schools if they want to install a photovoltaic system on the complex's roof. This could present an opportunity to work together to maximize the educational, environmental, and financial benefits of the system, while minimizing negative impacts on all parties.

Existing Sustainable Features or LEED Certification

Preference should be given to sites that are LEED certified or that include sustainable features that could be incorporated into the learning process. For example, the Bryant Park Bank of America building in Manhattan, which has obtained a LEED Platinum certification, would be an excellent choice. In contrast, a building that has not obtained certification may present unique opportunities to engage students and faculty in the LEED certification process of that building.

Cost Analysis

Cost may be one of the defining factors in the site selection process. Costs must be compared among candidate sites for any renovations, space conversions, construction costs, and other considerations to ensure that the project mission can be achieved within the project's budget.

Innovative Facility Design

Strategy # 2.2: Include innovative and state-of-the-art features

A state-of-the-art educational facility incorporates innovative elements such as smart classroom technology, energy monitoring systems, creative use of space, and other novel features into its design. These innovative technology features help maximize the educational and environmental benefit.

Creative Use of Space

Maximizing the effective use of space in schools can save time,

energy and ultimately, money. New methods of classroom design can provide innovative classrooms that are environmentally friendly.

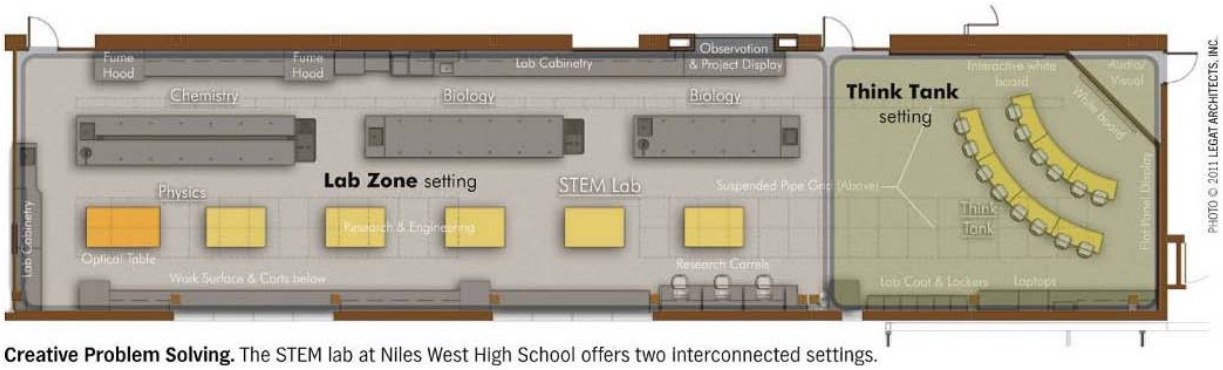
Moveable Walls

One specific design feature recommended is the use of moveable walls in classrooms. Moveable walls provide flexibility by allowing for the redesign of the size and shape of classrooms to accommodate different day-to-day requirements and changes in school enrollment over time. For example, moveable walls offer the flexibility to quickly convert several individual classrooms into one larger room for school-wide assemblies. This flexibility could be important to the HSS if the school is faced with limited space or not enough classrooms to meet all requirements separately. Modern moveable walls also offer options to come prewired with electrical and data transmission as well as providing work and shelving space. Moveable walls add to the sustainability of the school by avoiding much of the waste and debris from drywall construction and subsequent renovations. Additionally, many vendors offer moveable walls that are up to 98% recyclable following their use. Maximizing the use of space within the HSS is imperative for success in design. Moveable walls are significant assets to the school in that effort (Wittl, 2003). Movable walls cost approximately $250 per installed linear foot of 98% recyclable walls, with electric and communication outlets installed. Additionally, this feature decreases costs that would otherwise be spent on more expensive, less recyclable content and lower capability walls (Inscape, n.d.).

Classroom Layout

Individual classroom layouts are shifting from teaching spaces to learning spaces. Teachers are transitioning from seeing a front and a back of the classroom with static recipients stationed at desks, to a completely flexible space with ample technology to support learning. Classrooms afford areas for independent and group work, including spaces where computers and other technologies assist research and learning.

Alternative layouts are already utilized in specialized classrooms such as the Niles West High School in Skokie, Illinois. Its design features a lab space where students have the necessary equipment, utilities and technology to perform experiments across a range of science subjects. A “think tank” setup offers a collaborative space for students and teachers to reinforce concepts, discuss learning objectives and observations as well as facilitate peer review. This set-up is equipped with an interactive whiteboard, projector, screen and a full A/V system (Lembke, 2011).



Creative Problem Solving. The STEM lab at Niles West High School offers two interconnected settings.

Smart Classroom Technology

Innovative classroom technology aids the learning process by allowing teachers to augment classroom collaboration and interaction. Classrooms equipped with integrated learning and teaching technologies provide problem-based learning that incorporates technology into lessons and creates a learning environment where students engage and interact with teachers. The use of tools such as interactive whiteboards, laptops, notebooks, projectors, SMART boards, and monitors makes learning easier and assists teachers in delivering lessons in a concise and engaging manner. It is essential that faculty are well trained in classroom technologies, and that wireless connectivity made available in classrooms to allow the use of laptops and other wireless devices (Cryan, 2008).

Interactive Whiteboards

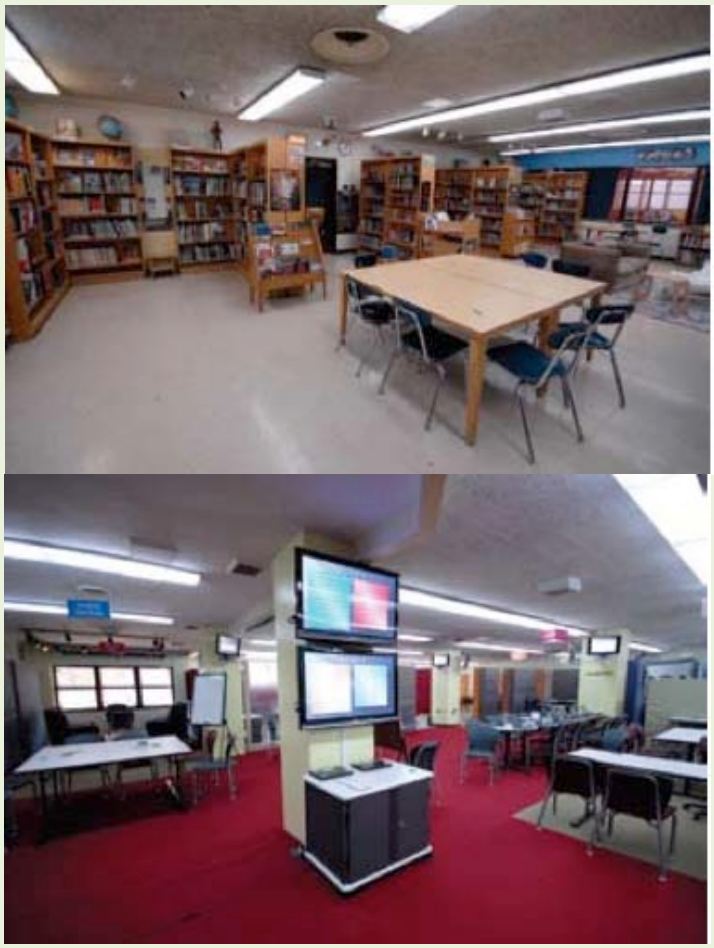
Companies like SMART Technologies provide great presentation tools that enable teachers to utilize an interactive approach to learning. Its innovations go beyond direct instruction through the use of modern display media. Interactive Smart Board's digital projector displays images from an in-class computer onto the board, where images can be seen and manipulated (Bell, 2011). The SMART Board has reached over 18 million students in 600,000 classrooms in more than 100 countries around the world (Cryan, 2008).

SMART Interactive Smart Board (SVC, 2008)

School of One – New York

The School of One (SoO) is an example of a school with innovative classroom design tailored to the instructional vision. SoO offers modal classroom instruction to individual meet student needs. Students are assigned a daily schedule via a logarithm designed to target each student's ideal learning plan. When each student enters the classroom, he/she can view his/her daily schedule on an LCD screen similar to an airport flight manifest (Muldoon, 2011). Each student has a different schedule based on how the student learns best, whether that is in a traditional classroom setting, in a student group, with a computer, or in other ways. A versatile classroom design is, therefore, a requirement of the SoO facility. Leading architects designed the space at each SoO locations and DSF helped to convert each space (NYC DOE, 2010a). The larger, reconfigured classroom space utilized by the SoO accommodates different learning modalities, improves supervision, and facilitates collaboration among teachers (Muldoon, 2011).

The HSS offers a different style of instruction than SoO, but the concept of using space to meet the versatile needs of individual students provides inspiration for the HSS leadership team to consider.



Source: School of One, 2011. Before and after shot of space conversion.

Energy Saving Strategies

The monitoring of energy use is vital and a first step to good energy management at the HSS. Installing smart energy meters that measure real time energy usage can help student identify sources of high energy consumption and monitor reductions over time (Crucible Technologies, n.d.). The installation of yellow-white shades to the windows increases comfort and clarity for the eyes, while increasing the effects of daylight in the classroom (daylighting), thus reducing the use of electricity during the day. Soundboards increase acoustic performance while serving as announcement and display boards for students. The use of low-energy saving lamp fixtures, as well as dimmable, energy efficient track lighting and ceiling fans are also imperative (Lilyblade, 2005). These energy saving strategies decrease the number of classroom lighting fixtures, while providing greater functional flexibility.

Science and Technology Labs

At least one main, multi-purpose science lab equipped with proper ventilation and safety systems is required to serve the science needs of the curriculum.

Separate Entrances

If the HSS is located in a mixed-use building such as an office building, students must have a private entrance and be prohibited from entering off-limit parts of the building.

Energy Management Plan (EMP)

An EMP allows the school to be involved in the energy monitoring process. Additionally, it encourages the HSS to focus on the elimination of energy and utility waste to achieve energy savings while enhancing the quality of the educational environment. A central energy-monitoring unit is used to analyze energy usage data. Data is continuously monitored electronically to identify peaks and leaks in the system. The EMP allows students to be part of the energy saving process and provide opportunities to learn energy savings skills that can be applied at home. These systems, along with other state-of-arts technologies, contribute to the exciting and innovative learning environment of the HSS.

Separate Energy And Water Systems

The feasibility of installing separate energy and water monitoring systems is important. This ensures accurate usage and billing information and also expands the potential for students to monitor and influence the school's energy and water usage.

Cafeteria Space

A cafeteria space for students is necessary especially if it is not available in an office building setting.

General Purpose Spaces

A commercial space or office building structure may not include sufficient space for a gym, auditorium, dance studio, changing rooms, or other similar spaces. The project team should consider the feasibility of providing such spaces,

assessing size, space, and budgetary constraints in the proposed site.

Converting a current school facility to a LEED-certified school is another potential choice for the HSS. The SCA Portfolio Planning Division assesses "open seats" (capacity to receive students). The HSS leadership team should begin communication with officials at the Portfolio Planning Division at the earliest possibility. These outcomes also present ample opportunities to engage students in practical application, innovation, and partnerships in green building operations and/or renovation through the Sustainability Research Workshops. A LEED-certified facility introduces students to energy monitoring and building maintenance systems, while a traditional school facility could expose students to LEED design and construction processes. These opportunities are further explored in the 'Facility as a Learning Tool' section.

Safety Considerations

Officials from the Urban Assembly School of Business for Young Women, a high school located in an office building in downtown Manhattan, informed our team that some students have been able to access floors of the building that are used for commercial space via the emergency stairwells. Therefore, it is imperative that proper fire and safety exits are maintained at all times. The HSS shall also maintain safety officers in accordance with DOE policy.

Innovative Facility: Case Studies

Examples of ground-breaking facility design are a useful reference for the HSS to consider. Highlights from the two unique case studies in this section illustrate some of the possibilities in green and innovative school design.

Fossil Ridge High School – Fort Collins, Colorado

Fossil Ridge High School is an example of a new construction high school that maximized sustainability from the design process through completion of construction. While the HSS is likely to occupy an existing building, we believe this case study is informative in providing the cutting edge in sustainable school design, beginning with the integrated design process. Fossil Ridge was created through a collaboration that included teachers, maintenance staff, engineers, and architects in the construction of the school. The building is LEED Silver certified, featuring photovoltaic panels, an off-peak ice thermal storage system, daylighting, and motion sensors to reduce demand for fossil fuel sourced electricity. The school grounds include a pond that collects stormwater runoff and provides sufficient water for the school's irrigation requirements. The interior utilizes paint with limited volatile organic compounds and tiling that does not require chemical based cleaning products in order to minimize toxic exposure to the students and staff (Rocky Mountain Institute, n.d.).

These efforts have resulted in creating an outstanding space for students and educators that minimizes impacts on the environment and saves over $70,000 a year in energy and water costs (Rocky Mountain Institute, n.d.).

Use of daylighting and solar panels in the design of Fossil Ridge High School.
Photo Credit: David Patterson (Rocky Mountain Institute, n.d.)

Urban Assembly School of Business for Young Women – 26 Broadway, Manhattan

Photo Source: Wikipedia

The Urban Assembly School (UA) of Business for Young Women is informative as a case study for the HSS because the high school is located inside a commercial office space in Manhattan. The high school occupies the 4th and 5th floors of the Standard Oil building, covering just over 45,000 square feet per floor. These areas were entirely renovated to suit the needs of an urban school at a cost of $32 million for Floors 4-6 and $19 million for Floor 7. Each grade 9-12 has about 100 students, and the classrooms cover approximately 150 square feet each (Tina Corso, personal communication, February 18, 2011).

A private entrance was secured for students in the building and elevators are programmed to only stop at Floors 4-7. Students arriving late are required to take the stairs instead of the elevator, which can be seen as a useful energy saving and healthy disciplinary policy. The school operates separate electricity meters from the rest of the building, allowing them to accurately monitor energy consumption. They share the building's boiler with the other building tenants, however and had to add piping to run from the basement to Floors 4-7 (Tina Corso, personal communication, February 18, 2011). The school has a dance studio, changing rooms, and a multi-purpose room used for assembly space or other athletics, and will share a gymnasium with the other schools on the ground floor by next year. Currently, students may access a gym membership off-campus.

Renovation of existing commercial spaces must be integrated with the operational needs of the school. Staff concerns at the UA School of Business for Young Women include ability of students to access off-limits floors of the building, incorrect location and type of fire extinguishers outside science labs, and industrial anti-slip stair coatings that can only be washed with a power washer, which is impossible to do in such an indoor setting. There is also a disconnect between the school's recycling program and building operations. The school's waste disposal contractor, Five Star Carting, re-sorts all the materials on site before hauling them away. Thus, the only value in providing separate waste receptacles throughout the school is to demonstrate recycling behavior (Five Star Catering, 2011). Officials at the HSS should ensure that the most efficient and cost-effective waste practices are in effect.

The School Space as a Learning Tool

Strategy # 2.3: Use the facility as a learning tool to enhance the curriculum

The sustainability concepts taught inside the classroom are augmented with the innovative physical features of the school facility to help bring the HSS to the forefront of sustainability education in New York and in the nation. The U.S. Department of Energy acknowledges that high-performance schools are "learning incubators" for energy and environmental concepts that can act as a central medium to convey the national priority for energy efficiency and environmental protection (US DOE EERE, 2008a). Every green feature of the school is a potential source for learning, from the sourcing of building materials to waste water management.

Sustainability research workshops allow the school building to be used as a learning tool. By using the building or parts of it as a working lab, students can learn first-hand the application of their skills and knowledge and feel a sense of accomplishment while forming strong bonds with their physical environment. Moreover, allowing students to be a part of the green conversion process of their school spurs ideas for collaborative research projects between the Research and CTE Workshops. Such an innovative approach to learning has the opportunity to instill a sense of ethics and values in the students, as well as allow for enhanced environmental stewardship and a keen interest in advocacy, innovation and education.

Table 5-A on the following page illustrates where potential features of the facility can be incorporated into curriculum subjects.

Table 5-A-1: Application of Features to the Curriculum

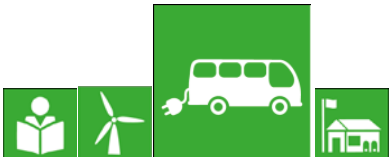
		9 Living Environmnt	9 Energy & Climate	10 Chemistry	10 Agriculture	11 Earth Science	11 WKSP Water & Waste	11 WKSP Water & Waste	12 WKSP Cities & Corps	12 WKSP Cities & Corps	12 Stats	9-12 Major Retrofit/ Renovate
Sites	Site Selection											✓
	Redeveloped Brownfield			✓		✓	✓	✓	✓	✓		
	Stormwater System	✓				✓	✓	✓				
	Shade & Pavement (Heat Island Effect)		✓						✓	✓		
	Green Roof or Reflective Roof (Heat Island Effect)	✓	✓		✓				✓	✓		
	Site Master Plan											✓
Water	Low Flow Fixtures						✓	✓			✓	
	Water Efficient Landscaping						✓	✓				
	Wastewater Systems						✓	✓				

Table 5-A-2: Application of Features to the Curriculum

		SCI Living Environmnt	WKSP Energy & Climate	SCI Chemistry	WKSP Agriculture	SCI Earth Science	RSCH WKSP Water & Waste	CTE WKSP Water & Waste	RSCH WKSP Cities & Corps	CTE WKSP Cities & Corps	MATH Stats	WKSP Major Retrofit/ Renovate
Energy	Energy Performance		✓							✓		
	Solar & Wind (On Site Sources)		✓	✓						✓		
	Measurement and Verification		✓							✓		
Materials	Recycling Storage & Collection						✓		✓		✓	
	Materials Reuse									✓		
	Recycled Content	✓						✓	✓			
	Regional Materials	✓			✓				✓			
	Rapidly Renewable Materials	✓			✓				✓			
	Certified Wood				✓							
	Lighting Systems (Low Hg, No PCBs)			✓								

Table 5-A-3: Application of Features to the Curriculum

		SCI Living Environmnt	WKSP Energy & Climate	SCI Chemistry	WKSP Agriculture	SCI Earth Science	RSCH WKSP Water & Waste	CTE WKSP Water & Waste	RSCH WKSP Cities & Corps	CTE WKSP Cities & Corps	MATH Stats	WKSP Major Retrofit/ Renovate
Indoor Environmental Quality	Outdoor Air Delivery Monitoring			✓						✓		
	Ventilation									✓		
	Low-Emitting Materials			✓						✓		
	Lighting Control									✓		
	Thermal Control, Design, Verification									✓		
Innovation	Innovation in Design											✓



Part 5: Reaching Out

Goal 3: ADVOCATE

Develop a community-centered school and a school model for sustainability

An Asset to the Local Community

The goals of the HSS should not just stop at education and innovation. As noted in Part 4, a rewarding and important element of the learning experience at the HSS is the ability for students to form a connection with their physical and local environments. Therefore, promotion of environmental stewardship while teaching the elements of a sustainability curriculum is an important part of the education provided by the HSS. Extended learning opportunities will allow for important relationships to be formed between students and local organizations that promote sound environmental and sustainable initiatives.

Strategy # 3.1: Provide connectivity with the surrounding community, promote environmental stewardship and create responsible citizens.

The HSS must aim to be an asset to the local community by applying the sustainability principles taught with the curriculum to local community projects that promote sustainability. These projects include 'greening' initiatives such as partnering with local businesses to develop green roofs and partnering with local community boards to be part of the maintenance of local parks and street trees. Additional projects include promoting community gardens and volunteering as environmental stewards within local communities. Furthermore, community partnerships encourage opportunities for students from the HSS to develop partnerships with students from local elementary and middle schools to promote community stewardship and share some of the sustainability lessons they have learned. Establishing important and mutually beneficial relationships within the community enhances the learning experience of students through practical application while benefitting the local community and creates responsible, well aware students.

Sustainable South Bronx

Sustainable South Bronx (SSBx) is an example of an organization that promotes local environmental stewardship in an urban setting. This organization was developed in August 2001 with the goal of promoting environmental education and encouraging greening programs in local communities in order to address economic, environmental and social issues. Based on its mission statement, SSBx uses a bottom up approach, i.e., targeting local community members and children to influence policy change. Additionally, SSBx also provides green job training as part of its program. Several efforts already in place to promote stewardship include, SmartRoofs LLC, a program created with the goal of developing green roofs in New York City, and Greenway, a program that employs people as environmental stewards and whose responsibilities include maintaining parks and tress within a designated 11-mile network. Local partners such as the Clinton Global Initiative, the Bronx River Alliance, MillionTrees NYC, and the Robin Hood Foundation, make such efforts possible through funding and support. In addition to the aforementioned programs, SSBx also encourages youth development in the form of internships, volunteer opportunities and after school opportunities (according to its website, SSBx partners with the Bronx Guild High School). An interesting and innovative aspect of its mission involves the GreenFab program, an after-school program, funded by NSF that aims to augment students' technology and engineering skill sets (SSBx, 2011a).

PART 6

FOOD SUSTAINABILITY IN THE NEW YORK CITY SCHOOL SYSTEM

How Does Food Relate To Sustainability?

Sustainability is best addressed through looking at its impacts on our economic, social and environmental well-being. This section explores how improving food systems in schools can address these core issues.

There is growing concern in the United States over health problems related to childhood obesity. A recent article in the New York Times explored the link between school lunches and overweight children given the high energy/ low nutrition quality of national school lunches. Simply stated, lunches of low nutritional value are served in schools because their attractive, inexpensive appeal assists in cutting costs. Through increased political awareness of this problem, an opportunity exists for change. The Department of Agriculture is set to issue guidelines on the total calories allowed in school lunches as well as provide additional emphasis on the nutritional benefits of a variety of fruits and vegetables (Rabin, 2011). This represents an opportunity to improve on a concerning social aspect impacting schoolchildren through improving the health of food served at HSS.

The New York City Sustainable Food Charter, sponsored by the Manhattan Borough President Scott Stringer is an excellent guide for improving NYC's food system. Mr. Stringer's work has cited a recent report that estimates the U.S. federal government will spend $344 billion per year by 2018 on health care costs related to obesity in the US (MBPO, n.d.a). This number helps to quantify the economic burden of inadequate food systems.

There are numerous environmental benefits to improving the quality of school lunches through increasing the amount of food sourced from regional farmers and reducing the amounts of meat and processed food. The NYC Food Charter cites evidence that one-third of the emissions related to climate change are a result of the current, global food system, with much of that coming from the production of meat (MBPO, n.d.b). The good news is NYC has come a long way in the past seven years. The nutrition of school lunches has improved dramatically over that time, with a focus on reducing trans fats and sugars and improving recipes to increase the amount of fruits and vegetables.

The HSS improves on these successes by pushing for greater local food sourcing in school cafeterias and introducing the

The Ironwill Foundation

The Ironwill Foundation, a non-profit, educational organization based in Haworth, NJ, addresses nutrition in schools and low-income communities. They focus primarily on spreading awareness on wellness in schools and low-income communities and provide an integrated curriculum for helping increase children's knowledge of nutritional issues (G. Salmirs, personal communication, April 7, 2011).

Ironwill runs a six-week program at the Mercy Center in South Bronx with the goal of building on what participants already know about the role of food in overall health. Although Ironwill's current curriculum is designed for 4th and 5th grade and their community programs, their existing lesson plans could potentially be adjusted to suit high school students.

Partnering with Ironwill is a great way for the HSS to develop food as a theme for teaching and living sustainably. An internship or workshop as a culminating experience for 12th graders is one way of partnering with Ironwill. This internship or workshop experience involves combining the elements of the sustainability education taught at the HSS with Ironwill's program to perform outreach to the community around the school or to younger students (Ironwill Foundation, 2010).

idea of eating seasonally. Emphasizing the consumption of local food reduces the carbon footprint through reducing "food miles" and helps support regional farmers.

How Does Food Relate To Education?

Grow to Learn is a public-private partnership between the NYC Mayor's Fund, GrowNYC and other government partners that assists schools in starting or continuing school garden programs by supplying seed money and educational materials (Grow to Learn NYC, n.d.). This organization has set a goal of having a garden in every public school in New York City and uses its effective model of providing funding and guidance to new school garden initiatives for each step along the way. Grow to Learn also provides programming that shows schools ways to use food from their gardens in the school cafeteria. It is this connection that is an effective complement to traditional class-based science and helps augment a standard health curriculum on sustainability.

It is important to make the school garden initiative appropriate to high school age students. Many of the organization's existing programs are geared towards younger students. Effective planning to tailor this to high-school students is essential. Lesson plans can include ways in which the school garden can assist in reducing impacts of events such as storm water runoff and urban heat island effect.

Composting provides yet another opportunity for connecting hands on sustainable activities to the classroom curriculum. Science teachers are trained to manage a compost system in their classrooms and encourage students to participate in community composting efforts, so they learn how compost is managed in New York City. There are potential opportunities for students to partner with the NYC Department of Sanitation to participate in compost-give-back programs. Partnerships offer an avenue for real world, practical nutrition education for students through internships and exposure to experts in the field.

Edible School Yard, New York

Brooklyn's P.S. 216 Edible Schoolyard Program (ESY) presents an exciting example of the application of design innovation to a sustainability theme, such as food. The ESY idea originated at the Martin Luther King Jr. Middle School in California and was conceived by chef and organic food activist, Alice Waters. ESY will see the conversion of part of the P.S. 216 asphalt yard into an educational, self-sustaining laboratory. Components of this laboratory include: a ¼ acre organic farm, a mobile 4-seasons greenhouse to ensure year-round learning and a classroom that teaches students methods behind the planting, harvesting and preparation of food. Additionally, P.S. 216 aims at integrating ESY into a standard middle school curriculum to provide augmented, interdisciplinary learning to its students. A partnership with the WORK Architecture Company ensures the sustainable design of the proposed ESY laboratory. Features of the design include: learning stations, dining tables and sustainable systems that produce energy, collect rainwater, process and sort waste and create compos (ESYNY, 2011).

How Does Food Relate to the High School for Sustainability?

Our recommendation is to assign a role to each year of the HSS.

9TH GRADE – SCHOOL GARDEN

Students are responsible for cultivating a school garden. This includes coordination with multiple parts of the science curriculum, but is primarily an opportunity for students to be hands on with the elements of food provision.

10TH GRADE – CAFETERIA FOOD SOURCING

Students study how the school cafeteria is sourced. The primary goal is an understanding of the resource intensity of our modern, global food system. Students identify and demonstrate how many different parts of the country, and the world, are involved in providing the food that they consume. In addition to sourcing, students study the processing and packaging of their cafeteria food, as well as identify ways to improve the sustainability of that supply chain. Ideally there would be some opportunity for bringing what is produced in the school garden into the cafeteria so that students benefit from their efforts in the garden. This establishes an essential understanding of the lifestyle of food.

11TH GRADE – WASTE COMPOSTING

Students are challenged to design and maintain a composting system for all the organic waste generated by the school cafeteria. Composting offers opportunities for students to learn ways to reduce load on the city's waste processing system and provides insight on how valuable soil nutrients are replenished. In addition to running an effective composting system, students are responsible for working with their younger classmates to fertilize gardens developed and maintained by ninth graders.

12TH GRADE – INTERNSHIP

Students put their skills to work in the real world through internships with partner organizations, such as Ironwill. Students work with outside organizations to learn and teach the aspects of a healthful diet, such as consuming whole foods and being mindful of sugar intake. Partnering with willing organizations offers the possibility of working in communities that neighbor the school to assist in passing on these important lessons to others.

Part 7: New School Application and Implementation

Goal 4: CREATE

Open the High School for Sustainability in September 2012

Types of Schools

Several different distinguishing criteria for high schools in New York City are curriculum, size, governance, competitiveness of entry, and mission. Some of the classifications listed on the "Choices" section of DOE's website include Career and Technical Education Schools (CTE), Charter Schools, Small Schools, and Specialized High Schools.

DOE specifies that charter schools are public schools that operate independent of the DOE. They are "governed by their own not-for-profit boards of trustees, which operate on the terms of five-year performance contract known as charters" (NYC DOE, 2011j). Admission is decided by lottery. Charter schools are free to "establish their own policies, design their own educational programs, and manage their human and financial resources" (NYC DOE, 2011j).

Small schools are defined as those with a "maximum enrollment of 550 students and a maximum ninth grade enrollment of 175 students" (Quint et al, 2010, p. 24). Small schools exist as a growing alternative to medium (551-1400 students) and large schools (1401 students and larger). These schools offer curricula designed to ensure that all students meet high standards and graduate (NYC DOE, 2011c). The "Choices" site makes a distinction between small schools and small learning communities (SLCs), although the only readily perceptible difference is that SLCs are located within educational campuses. Educational campuses are the buildings of former large schools that were repurposed to suite several small schools inside (NYC DOE, 2011n).

There is also the question of whether the school would be screened or unscreened. Screened schools rank applicants based on academic performance in middle school (e.g. seventh grade report card, standardized test scores in reading and math), as well as various other criteria such as attendance and punctuality in order to determine admission selections. In certain cases, interviews, essays, and additional diagnostic tests may be part of the screened school application process. Unscreened schools, on the other hand, are obligated to admit applicants at all levels of academic performance. Although some preference may be extended to those students who demonstrate their interest in a particular school in

person at a high school fair, ninth grade classes are generally chosen at random from the pool of applicants (NYC DOE, 2011j).

There are only nine specialized schools in New York City. They utilize the Specialized High Schools Admissions Test (SHSAT), performance auditions, and other advanced screening methods to determine members of their incoming classes. Students in the five boroughs are eligible to apply to all specialized schools. Students may be chosen for their achievement level or a specific talent. The city's nine specialized high schools, established under New York State Law (2590 — Section G), are highly selective (InsideSchools, 2008). The authority to open a specialized school originates at the state level and is likely outside the realm of possibility for DSF.

Trends in Secondary Education in NYC

The landscape of public high school education in New York City has been in a state of dynamic transition for nearly a decade. Starting in 2002, DOE began closing the large schools with the lowest graduation rates (<45%), known as "drop out factories" (Quint et al., 2010, p. 5). In their place, the DOE began implementing small schools open to "students of all levels of academic ability, but especially geared to serve low-performing students who would otherwise have attended the large schools that were closed" (Quint et al., 2010, p. 12). Twenty-three large and midsized high schools closed (stopped admitting 9th graders) between the 2002-2003 school year and the 2007-2008 school year, while 115 "new small schools" began operation during the same period (Quint et al., 2010, p. 26).

The trend towards small schools has some implications for the HSS. The trend dictates that the type of new school most commonly approved is small schools. New small schools tend to emerge where large schools fail. Student enrollment in small schools has increased from 5.4% of total student enrollment in 2002 to 18.5% in 2008 (Quint et al., 2010, p. 27) (See Appendix I). Places where schools fail tend to be located in poverty-stricken areas. Most of the new small schools opened between 2002 and 2008 were located in the Bronx and Brooklyn (Quint et al., 2010, p. 26).

At the beginning of the process for developing a strategic plan for the HSS, DSF expressed particular interest in creating a small school. This request fits well with the DOE's trend towards small, themed schools, and this plan recommends implementing a small, unscreened school.

Organization & Administration

Strategy # 4.1: **Organize a strong and effective leadership team**

Recommended Characteristics of a School Leader

The HSS's success depends on the qualities of the proposed school leader, who is responsible for taking

the lead throughout the application process. This person is the future principal of the proposed HSS. His or her professional and personal qualities are instrumental to the success or failure of both the application and the successful functioning of the HSS. The following list details the qualities, credentials, and experience desired in the HSS leader.

Qualities:

1. Deeply committed to both the success of the students and to the principles of sustainability.
2. Dynamic, engaging, outgoing, assertive, passionate, enthusiastic, and personable.
3. Well-versed in public relations;
4. Highly experienced in communicating with administration, staff, faculty, parents, community members and partners.
5. A compassionate and just educator.
6. Innovative, welcoming of new ideas and supportive of new and different solutions.
7. Possesses a strong instructional vision.

Credentials:

1. NYC Leadership Academy for Principals "Aspiring Principals Program"(APP).
2. New Leaders for New Schools, or other such programs (NLNS)
3. Bachelors/Masters in: Education/Science/Management/Engineering.
4. 10+ years Teaching/Management Experience.

Experience:

1. Previous administrative experience (principal or assistant principal) in a diverse, urban setting, working with underserved or under-performing students.
2. Previous success in improving student performance.
3. Past success opening another school, if applicable.
4. Ideally has experience in CTE and green trades.
5. Wealth of experience working with children of diverse educational and cultural background.
6. Strong background in science, sustainability initiatives or sustainable design.
7. Experience in management, finance and/or budgeting.
8. Experience in public and private sectors (for securing and negotiating partners);
9. Proven dedication to community service.

Recommended Components of the School Leadership Team

The School Leadership Team assists the HSS School Leader in his or her quest to open the HSS with complementary skills and supportive efforts. Some suggested components of an effective team are:

1. **Assistant Principal**
   A dedicated assistant principal is crucial to the leader's capacity to successfully manage a team. Identifying and bringing onboard the right deputy early in the process contributes to the stability of the new schools opening process.

2. **Sustainability Coordinator**
   The sustainability coordinator is a pre-defined position within DOE. A competent, pro-active, and up-to-date expert in sustainability issues adds great value to the School Leadership Team.

3. **Academic Specialist**
   A DOE academic specialist provides much-needed internal knowledge and experience. He/she should be an education professional with well-developed knowledge about DOE procedures and teaching experience.

4. **Partnership Coordinator**
   New York City houses a growing community of sustainability-focused enterprises. From non-profits, to corporations and professional clubs, there exists an intimate yet growing network of socially and environmentally conscious organizations and individuals. Identifying an individual with inside knowledge and existing relationships within this space increases the inflow of resources from the community to the HSS. Early involvement from partners is also important for the planning of the experiential learning opportunities and CTE pathways. The position is a full-time job. Experience with grant-writing is a plus, as there may be opportunities available for start-up grants.

Appendices VI, VII, VIII provide additional information on characteristics of a school staff and further details including organizational charts and descriptions of staff positions.

Funding

The recent trend of new small schools in New York City was significantly supported by outside funding. “By the 2006-2007 school year, Gates Foundation funding had supported nearly 2/3’s of all small high schools in New York City (along with 85 % of the new small high schools” (Quint et al., 2010, p. 20). The Urban Assembly School for Green Careers, (UASGC) received $500,000 in start-up funding ($100,000 x 5 years) from the Gates Foundation and has a number of non-profit and corporate partnerships (Alexandra J. Rathmann-Noonan, personal interview. March 17, 2011). See Appendix IX for detailed information on potential grant opportunities.

Small schools receive two classes of funding, from the DOE and from outside sources, such as grants and partnerships. Table 7-D on the following page illustrates the 2011 fiscal year DOE funding for nine environmentally-themed high schools. All schools noted in Table 7-D are small schools, with the exception of the High School for Environmental Studies. As the Rockaway Park High School for Environmental Sustainability began operation in the fall of 2010, their first year budget provides special insight to the HSS as it prepares for its first year. The budget for the UASGC offers similar insights to a school in its second year of operation and that of the Brooklyn Academy of Science and the Environment provides insights into a school that has been in operation for more than four years. Budgets for these schools are provided in Appendix X.

Although principal salaries do not vary significantly, leadership teams vary in size from one individual earning $133,834 at the UASGC, to seven individuals (1 principal and six assistant principals) earning a total of $810,752 at the High School for Environmental Studies (“Galaxy”, NYC DOE 2011). Although the two schools are quite different, it is worth mentioning that organizational support provided by the Urban Assembly likely replaces the need for a DOE-funded leadership team (supported anecdotally through personal communication with Principal of UASGC).

The gradual transition of personnel and funding from a first-year small school like Rockaway Park (10 DOE staff, $1.2 million DOE Budget), to a second-year small school like UASGC (30.5 DOE staff, $1.9 million DOE budget) to a fully-operational small school like Brooklyn Academy for Science and the Environment (47.72 DOE Staff, $3.8 million DOE budget), seems to be an incremental one (“Galaxy”, NYC DOE 2011).

Table 7-A: DOE Funding for Environmentally Focused New York City High Schools

("Galaxy", NYC DOE 2011; "Online High School Directory Search", NYC DOE 2011)

School	2010-2011 Enrollment	Principal's Salary	Leadership Positions (FTE)	Leadership Total	High School Departments Total	Grand Total Positions (FTE)	Grand Total Budget
Brooklyn Academy of Science and the Environment	440	$150,926	2.22	$278,180	$2,152,763	47.72	$3,768,463
Academy for Environmental Leadership	354	$140,074	3	$361,555	$1,339,556	39	$3,276,510
High School for Environmental Studies	1403	$154,295	7	$810,752	$4,241,766	97.4	$8,040,334
Gateway School for Environmental Research and Technology	484	$146,013	4	$486,458	$2,283,633	50.5	$4,475,099
Rachel Carson High School for Coastal Studies	456	$145,507	3	$373,512	$1,760,091	43	$3,521,357
Green School: An Academy for Environmental Careers	351	$140,074	3	$286,629	$1,408,743	41.8	$2,910,265
*Academy for Conservation and the Environment	195	$136,959	3	$313,056	$941,628	24.5	$1,753,893
*The Urban Assembly School for Green Careers	192	$133,834	1	$133,834	$1,195,643	30.5	$1,937,908
*Rockaway Park High School for Environmental Sustainability	99	$132,636	2	$237,073	$319,799	10	$1,193,188

The table above illustrates features of the FY 2011 budgets for nine NYC environmentally-focused high schools. Leadership positions are usually principals and assistant principals. FTE stands for full-time equivalent; a fractional number for leadership positions indicates that a position is part-time, or that an employee's responsibilities are split between positions. High School Departments Total reflects the personnel expenses associated with the curriculum offered. Grand Total Positions represents the total number of positions funded by the DOE. Grand Total Budget shows the total amount of DOE funding granted. These figures do not reflect outside sources of funding.

* Are at various stages of implementation. At the date of this research, they have not yet graduated their first class.

Strategic Partnerships

Strategy # 4.2: Establish critical and engaged partnerships

Strategic partnerships aid a new school's mission by appropriate utilization and application of each partner's respective resources and expertise. The new schools process emphasizes the importance of partnerships in the application process. The benefits that the HSS would receive by partnering with outside organizations may be more apparent than the benefits the organizations themselves may receive. DOE breaks partnerships into seven categories: Community-Based Organizations, Hospital Outreach, Higher Education Institutions, Cultural/Arts Organizations, Not-for-Profit, Corporate, and Other. Government organizations fall within the "Other" category.

For the first year of the HSS, we recommend that the leadership team assign strategic partnership duties to the Assistant Principal 2. In the long-term, the HSS would ideally create a dedicated strategic partnership coordinator position. The partnership coordinator must have extensive experience in areas such as grant writing, organizational development and fundraising. Even more importantly, he or she must bring pre-existing relationships within New York City's sustainability community and be able to leverage these relationships into real working partnerships with the HSS.

Junior Energy

Junior Energy, a non-profit organization based in Englewood Cliffs, NJ, partners with schools to increase students' awareness of energy efficiency techniques and empower young people to take action in their schools and homes. Junior Energy endeavors to promote sustainable energy and energy consumption habits within classrooms. Curricula developed by Junior Energy appropriate for kindergarten through 12th grade students are accessible to teachers online. These ideas help students become actively involved in understanding the impacts of energy use and efficiency in the real world. Utilizing the practical applications of Junior Energy's energy efficiency lessons provides an effective opportunity to augment the sustainability curriculum of the HSS with hands-on research (Junior Energy, 2010).

Website: www.juniorenergy.org

Opportunities exist for the HSS to form a variety of potential partners in New York City. Appendix XI contains a small sample of organizations currently partnering with DOE high schools in some capacity and provides a good starting point for thinking about what organizations are open to partnerships.

Community-Based Organizations

The potential for community-based partnerships is highly dependent on where the school is located. Once a site is determined it is paramount that the leadership team identifies organizations operating at the local community level to improve social and environmental conditions. One good example of this type of organization is Sustainable South Bronx (mentioned in Part 5 of this report).

Hospital Outreach

For a Hospital Outreach partner, the leadership team should look first within its immediate geography. Hospital organizations are located throughout the 5 boroughs. A strong emphasis on social equity should be considered when partnering with a hospital. For example, the NewYork-Presbyterian Hospital houses a Department of Social Work that has been in existence for over 75 years and is a leader in social work practice, education and research (NYP, n.d.).

Higher Education Institutions

As the HSS at its inception has a connection with Columbia University through its MPA ESP program, perhaps a continued association would make sense. Other areas within Columbia that could be a good fit include CERC and the program of Sustainability Management (SUMA) located within the Earth Institute.

The **Center for Environmental Research and Conservation (CERC)** builds environmental leadership and emphasizes the essential role of the natural environment in sustainable development. Through the synthesis of research, education and training, CERC aims to conserve biological diversity and cultivate leadership to address the ecological challenges of the 21st century. CERC is headquartered at the Earth Institute, Columbia University.

Cultural/Arts Organizations

Cultural/Arts Organizations are generally sympathetic to environmental and sustainability concerns. In this specific area, the HSS leadership team should consider which organizations are most interested in spending time and resources at the HSS. One example is Maysles Cinema, located in Harlem, who could be interested in screening cultural films at the school.

Not-for-Profit

There are several possibilities for the HSS to be involved with not-for-profit organizations such as Iron will, Junior Energy and GrowNYC. It is important when partnering with a not-for-profit to explicitly determine their function, i.e, find out what value they would bring to the HSS and make certain these resources are clearly defined and can be effectively utilized.

Corporate

Corporate partners should offer real value through either funding or services to the school. For instance, Bank of America may donate classroom space within their LEED certified headquarters. All the major banks within this city of finance now house sustainability programs, directors or initiatives. Goldman Sachs has donated funds to New York Schools through its foundation and has an Environmental Stewardship and Sustainability division (Goldman Sachs, 2011).

Other

In addition to those mentioned in Appendix II of the report, government organizations such as the Mayor's Office of Long Term Planning and Sustainability could be a good fit with the HSS.

Lead Partners / Intermediary Organizations

DOE defines a lead partner or intermediary organization as "an organization that takes a potential new school from concept to creation and implementation" in the planning stages and recruits a potential school leader to carry out the organization's instructional model. After a school has successfully opened, the lead partner continues to give support for implementation, principal leadership and professional development, and other services to ensure high academic performance (NYC DOE, 2011).

During the new school application process DSF has the option to bring in a Lead Partner. Lead Partners have experience and expertise in opening schools and can trace their origin back to October 2002 when the Bloomberg Administration made small school creation a priority. The New Century High Schools (NCHS) initiative launched by New Visions in 2001 immediately preceded the Mayor's Children First initiative and served as a model for new small school creation under the initiative. The objective of NCHS was to establish new small high schools and New Visions was the key intermediary organization for these new schools. While New Visions was slated to play the leading role in new school creation under Children First, it lacked sufficient capacity to set up all the new schools that would be needed and the DOE opened up the lead partner program to other organizations that met a stringent lead partner accreditation process (New York City's Changing High School Landscape pg. 17-19).

Urban Assembly, a nonprofit organization aimed at preparing underprivileged children in under resourced neighborhoods in New York City, is another example of a lead partner. Together with the work of Mayor Bloomberg, New Visions and the DOE, the Urban Assembly now serves 21 middle and high schools and 8,100 students in the city's most underserved locations. Urban Assembly's guiding principles include: college preparation, provision of academic professional partnerships and theme-based curriculum learning. Their goal is to achieve 100% college admission for students. At present the Urban Assembly Schools maintain a 76% graduation rate – much higher than the DOE's rate (Urban Assembly, 2011). A partnership with New Visions, Urban Assembly or another lead partner organization is one option available to a new school sponsor. However, this is not a requirement and many new schools opening today do so with their own lead team of professionals and do not rely on a lead partner. The table in Appendix XII lists intermediary organizations that have received Gates Foundation funding as of the 2006-2007 school year. Many of these organizations are still operating as lead partners in the city and could serve in this capacity for the DSF.

In making the decision whether or not to use a lead partner DSF should weigh both the advantages and disadvantages such a partnership would bring. An advantage would be that the lead partner is familiar with the new schools process and has experience and expertise in this endeavor. A disadvantage would be a potential loss of authority to the lead partner. This report recommends that DSF forego a lead partner and take the lead in opening the HSS, focusing on other strategic partners discussed previously in this report.

The New School Application Process

Strategy # 4.3: Prepare a comprehensive and successful new school application

The center of the New Schools Process is the New District High School Application and attendant workshops. Full details and a sample application can be found at the new schools proposal website. Private communication with Ami Patel at the New Schools Division within DOE confirms that there will be a round of workshops and application deadlines in fall 2011, but that the dates and deadlines have not yet been determined. Using the 2010 dates as a guideline, it is likely DOE will hold a New Schools Open House in September with a Letter of Intent due early October 2011, but this is subject to change. It is paramount that the HSS leadership team keeps a close watch for approaching deadlines in the fall of 2011. The following section gives an outline of the new schools application sections and recommendations for addressing them.

Section 1: Mission Statement

Through the workshop team's brainstorming sessions, several important goals that the HSS should embody were agreed upon that informed the mission statement in Part 2 of this document. However the eventual HSS leadership team will come up with a mission statement of it's own that better reflect its own vision for the school.

Section 2: School Curriculum and Instructional Model

As a DSF-sponsored model school for sustainability, the HSS should aim to be innovative in its choice of school curriculum and instructional model. Part 3 of this report provides a handbook to reference when completing this section of the application.

Section 3: School Structure and Design

The student and teacher schedules and the staffing plan described in the curriculum and implementation sections, respectively, provide a strong foundation to respond to this section of the application. The detailed information about a new staff position, the partnership coordinator, will also come into play in addressing how staffing priorities align with the HSS's mission, school design and overall instructional plan.

Section 4: Developing and Supporting Your School Staff

DOE currently has numerous professional development programs in place to support school staff. For example, a 14-month intensive program called Leadership in Education Apprenticeship Program (LEAP) is available for educators aspiring to become principals (NYC DOE, 2011p). New teachers are assigned to mentors under DOE Division of School Support, and collaborate on teaching plans, classroom practices, etc.;

participants must complete 175 hours of professional development before applying for a Professional Certification (NYC DOE, 2011p). A web resource called Professional Development and Student Opportunities is available for educators to share and find specific information district-wide, such as workshop and conference dates, certification information and new developments (NYC DOE, 2011o). Other training programs available through DOE include the New York City After School Professional Development Program, the College Level Examination Program, AED/CPR Training Program, and Bilingual Pupil Services Program (NYC DOE, 2011t). Finally, there are financial support programs such as the Summer Stipend and Teach NYC Programs (NYC DOE, 2011t). It is imperative to first look into these existing resources available outside of the HSS's first year budget before determining allocation for professional development.

Section 5: Tracking and Assessing Student Progress

DOE has an extensive performance management system assessing student academic progress and school environment (see Performance Management). The key measures chosen by the HSS leadership team should be consistent with DOE's set of metrics in order to successfully meet city, district and state standards.

In addition to the body of the application, the applicant is required to submit three attachments.

- Attachment A: Applicant Team Resumes
- Attachment B: Letters of Support
- Attachment C: High School Directory Page Instructions

Furthermore, the application contains three appendices.

- Appendix A: Letter Of Intent
- Appendix B: Criteria for Selection
- Appendix C: High School Directory Page Template

Long-Term Planning

Strategy# 4.4: Develop metrics for long-term planning and performance management

Upon the successful completion of the HSS's first academic year, there are academic and administrative milestones that should be carefully considered and developed.

Academic and Performance Review

- Assessment of student academic progress over the course of the first year can be done via the analysis of student standardized test scores in reading, writing, and mathematics. Faculty must update the curriculum to improve student performance.
- The administration needs to determine a way to assess teacher effectiveness in the classroom and provide necessary remediation.

- The administration should carefully design and implement a plan for the continued professional development of faculty and staff.
- The administration should examine student attendance and behavior. The HSS's school-wide behavior plan should be evaluated and adjusted for the upcoming academic year.

Curriculum and Staff Development

- The administration must carefully improve its curriculum and design an expanded staffing model for the incoming freshmen and sophomore class.
- The administration must consider developing the English Language Learners (ELL) curriculum and hire ELL staff.
- The administration should develop a series of after-school enrichment activities for the student body.

Budget Analysis and Resources

- The administration should carefully review the annual budget and make any necessary adjustments to academic programs and student services offered
- The administration must examine existing and potential funding streams with the goal of expanding corporate and academic partnerships, grant money from state and federal sources, and overall per pupil levels of funding.
- The administration must address the need for additional classroom and school-wide resources including: books and additional learning materials, in-classroom technology, etc.

Community and Parent/ Guardian Involvement

- The administration should consider the best ways to address the concerns of the Parent Teacher Association and school-wide community.

Potential Obstacles and Challenges

Physical Space and Infrastructure

- The administrative team will face the challenge of finding an appropriate location to house the incoming class. The costs associated with potential renovations and remodeling must be considered. The administration must also prepare a space for an additional three grade levels over the course of four academic years if an incubator school is used for the first year.
- The school administration must be able to deal with the challenges of adjusting to a growing organizational

structure and the careful expansion of faculty and staff.

Funding and Budget Constraints

- The administrative team will be faced with the challenge of securing foundational grants.
- There is a shortfall at both the state and federal level for educational funding.

Academic Challenges

- The school must focus on student achievement resulting in high-standardized test scores for reading, writing and mathematics. This can be very challenging for a school in its infancy; curriculum has not been fully developed, implemented, and tested. The administration must develop careful metrics for state-based and alternative assessment.
- The idea for a sustainable environmental public high school is not new- especially in New York City. The administrative team must carefully consider how it will create a school that creates a unique learning environment and value for the student body.
- The administration must face the challenges of student retention and dropout prevention.

Student Behavior and Code of Discipline

- The school will be faced with an incoming class of various ethnicities, academic abilities, backgrounds, and interests. It will require careful planning to create a secure and safe environment that meets student needs. Disruptive student behavior has the potential to hamper further academic progress and student engagement.

Student Socioeconomic Status and Home Environment

- The HSS is likely to require additional student services for students coming from various cultural backgrounds.

Administrative and Faculty Retention

- The administration must carefully consider the ways in which it will create a strong collaborative environment amongst its educators that fosters professional development and teacher retention. This can be a daunting task for new schools.

Performance Management

The HSS, like other DOE high schools, will annually be held accountable for academic progress and school environment under four accountability tools developed by DOE: the NYC School Survey, Quality Review, State and Federal Evaluation, and the NYC Progress Report (NYC DOE, 2011u). This system of accountability was agreed upon by principals and the city in 2007 to

allow principals to meet student performance targets without the oversight of superintendents to determine appropriate decisions and resources (Herszenhorn, 2007). Below is a brief description of each tool and a focus on key metrics in the Progress Report to determine ways of ensuring the HSS's success in meeting city and state standards.

NYC School Survey

The annual School Survey provides feedback on schools from teachers, parents and students in grades 6 -12 to assist school leaders in understanding their school environments from a community perspective (NYC DOE, 2011u). Results are analyzed at individual school, district and citywide levels and contribute 10-15% of a school's Progress Report grade (NYC DOE, 2011). The survey includes topics such as "academic expectations, communication, engagement, and safety and respect" (NYC DOE, 2011u).

Quality Review

The Quality Review measures the quality of a school's efforts in effectively meeting students' academic needs and implementing ways to achieve success. The score is determined by an on-site two or three day observation by an experienced educator, and is based on a four-point scale: Well Developed, Proficient, Underdeveloped with Proficient Features, and Underdeveloped (NYC DOE, 2010a). This score is separate from the Progress Report grade.

State and Federal Evaluation

New York State (NYS) requires a separate accountability indicator called the New York State Annual School Report Card, which measures a school's status of meeting the federal No Child Let Behind Act (NCLB) (NYC, DOE, 2010). NCLB requires that underperforming schools must provide supplemental education services (e.g. free tutoring) and revise operations to meet performance standards within five years (NYC DOE, 2011). NCLB and NYS require student proficiency in English Language Arts (ELA), math and science (NYC DOE, 2011).

NYC Progress Report

The Progress Report tracks academic progress at individual, school, district, borough and citywide levels in order to identify steps to improve learning, plan ways of implementing steps and revise implementation as necessary (NYC DOE, 2010a). Schools receive letter grades (A-F) in three main areas as well an overall grade; schools that successfully help students most in need of attention and improvement receive additional recognition for Exemplary Student Outcomes (NYC DOE, 2010a). The three main areas are:

- School Environment (15% of overall score);
- Student Performance (25% of overall score); and
- Student Progress (60% of overall score).

See Appendices XIII and XIV for more details.

Conclusion

In providing a strategic vision for accomplishing the goal of opening the High School for Sustainability (HSS) by September 2012, we make the following recommendations:

- The HSS should be small, unscreened and located in close proximity to public transportation.
- The curriculum of the HSS should be based on a standard Regent's curriculum augmented with co-curricular and extended learning activities, which include: CTE instruction, sustainability research workshops, mentorships, internships, career development and community outreach.
- The school building should contain innovative and green features, be LEED certified, and integrated into the practical components of the school's curriculum.
- Strategic partnerships are essential in providing a challenging, visionary and effective sustainability education. Partnerships will enable the HSS to set itself apart while meeting its goals of ensuring 100% graduation rates and preparing students for college and green careers.
- Opening a new school in the fall of 2012 is an ambitious and challenging, yet manageable task. To ensure that the doors open at the HSS next year, it is paramount that all milestones are achieved on schedule and that DSF consistently adheres to the requirements and timeline of the application process.
- Most importantly, DSF should immediately identify a leader who will lead a team of committed and experienced individuals throughout the application and implementation process.

The HSS provides a continued opportunity for DSF to promote sustainability principles within New York City and prepare the next generation of students to lead us to a more sustainable future.

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Appendices

APPENDIX I: COURSE DESCRIPTIONS

The list below contains descriptions of key topic areas to be integrated into the sustainability curriculum. Each area cites authors of introductory textbooks for further reference.

The Earth's System

Water/Hydrology

Students gain an understanding of the earth's hydrologic cycle. Students should also be able to grasp how humans gather water from the earth, use it for drinking and agriculture, and how water is treated and returned to waterways (Brutsaert, 2005).

Environmental Chemistry

Students learn about chemical and biochemical processes that occur in the natural world. Topics include: chemical reactions in the air, soil, and water; the uncontaminated environment; naturally occurring chemicals; and the contaminated environment (Andrews, et al., 2004).

Climatology

Students learn about the earth's climate system. Additionally, it addresses the contemporary issues of environmental change, from study of the dynamics of the weather and climate system to projections of future climate (Kump, et al., 2004).

Ecology/Diversity of Life/Biodiversity

Students learn about the relationship of living organisms with each other and their surroundings. Relevant topics are: ecosystem communities, ecosystem services, biodiversity, and the evolution of species (Townsend, 2008).

Interconnectedness

This topic area focuses on the relationship between humans and nature. Relevant topics include: the effects of the natural environment on human health; and the relationship of population, consumption, technology and carrying capacity with the biosphere (Edwards & Orr, 2005).

Humans, Human Impact, and Sustainability Challenges

Climate Change

Students learn the fundamentals of global climate change. Relevant topic areas are: causes of global warming, carbon dioxide in the atmosphere and the carbon cycle, human fossil fuel consumption, and energy efficiency (Mathez, 2009).

Sustainable Energy

Students learn human energy requirements, consumption, and effects on the earth. Students gain an understanding of the key challenges in developing a sustainable energy future. Students also learn about different types of energy and non-carbon energy (Evans, 2007).

Sustainable Agriculture/Food Production

Students learn about human agriculture systems and food production. Relevant topics in this area are water intensity of crops, land use requirements, land use policy, homogeneity of crops,

pesticides, energy requirements of crops, sustainable agriculture, and mass animal food production (Ikerd, 2008).

Waste / Consumer Goods

One of the challenges that humans face in creating a sustainable future is coping with the immense amount of waste generated by the materials economy. Relevant topics in this area are recycling, the history of waste management, municipal waste collection, waste incinerators and landfills, toxic waste chemicals, and the energy requirements of the materials economy (Vaughn, 2008).

Toxic Substances in the Environment

Students learn about the toxic substances produced by industries around the globe and the history of toxic substance management. Relevant topics in this area include: Superfund sites, toxic substances in the environment, public health impacts, clean-up case studies, and toxic waste cleanup around the world (Francis, 1994).

Green Buildings/Green Architecture

Students learn about the benefits of green building. Relevant topics include: the USGBC's LEED rating system and other green building rating systems, energy use in homes and commercial structures, lighting efficiency, heating/cooling efficiency, and sustainable site selection (Wines, 2000).

Transportation

As the world's population grows, transportation and transportation efficiency become increasingly important Relevant topics in this area include: public transportation and transportation systems, including automobile, rail and air; energy efficiency in transportation; and electric vehicle development (Black, 2010).

Human Efforts

Environmental Policy/Government Legislation

Students learn about environmental policy efforts in the U.S. and around the world. Relevant topics are environmental law in the United States, the Kyoto Protocol, the United Nations Framework Convention on Climate Change and other international frameworks, the Intergovernmental Panel on Climate Change, and the establishment of carbon markets (Cohen, 2006).

Corporate Sustainability Efforts

Many corporations have started to incorporate sustainability into their business practices. Relevant topics in this area are corporate social responsibility, sustainable business practices, and supply chain sustainability (Hawkins, 2006).

Ethics and Values

Students learn about issues involving culture, sustainable development, and equity and justice. Relevant topics are environmental justice, the ethics of human intervention, and human/animal interactions (Pojman, 2007).

Lifecycle cost assessment

Students learn about the business aspects of sustainability. This is taught in conjunction with the math curriculum (client suggested).

APPENDIX II: POTENTIAL EDUCATIONAL PARTNERS FOR THE HSS

Organization	Description
The Urban Green Council	The Urban Green Council emphasizes advocacy and provides workshop courses on green construction and LEED certification. This partnership augments the CTE component of the curriculum with practical, hands on experience from knowledgeable professionals. Students have the opportunity to learn New York City's green building standards (USGBC, 2011a).
PlaNYC	The goals of PlaNYC include: creating sustainable buildings, improving water and air quality, reducing greenhouse gas emissions, cleaning up contaminated land and providing improved and additional park areas for New Yorkers. Forming a bond with the Mayor's Office of Long-term Planning and Sustainability, which administers PlaNYC, is a valuable first step in providing a practical educational experience for HSS students (NYC Office of Long Term Planning and Sustainability, 2011).
GrowNYC	An extension of PlaNYC, GrowNYC is a non-profit organization whose goal is to enhance quality of life via educational environmental programs such as its Greenmarket Youth Educational Project. A partnership with GrowNYC allows for an interactive approach to bridging the gap between farmers, the food they grow, and students of the HSS (GrowNYC, 2011).
National Oceanic and Atmospheric Association (NOAA)	This federal agency has an Educational Partnership Program that supports the following projects: 1) The High School Pipeline Project and 2) The Environmental Demonstration Project. Both are targeted at augmenting school curricula with advanced and current NOAA-related science in order to encourage environmental entrepreneurship and pursuit of advanced, higher education degrees (NOAA, 2010).
Environmental Protection Agency (EPA)	EPA's "green-kit" curriculum supplement for sustainability includes various activities such as an interactive "Planet Earth" feature and "The International Education and Resource Network," which allows students to undertake projects that impact the Earth's health and welfare. These activities are a great addition to the curriculum, exposing students to the environmental science and sustainability research conducted at the federal level. Potentially, a partnership with the EPA provides opportunities for job shadowing and internships related to the curriculum (EPA, n.d.).
National Science Foundation (NSF)	NSF is one of the largest supporters of engineering and science research in the country, providing funding through the National STEM Education Distributive Learning Project. Engineers at Tufts University use this funding to develop the Student Teacher Outreach Mentorship Program (STOMP), which pairs undergraduate and K-12 students in an educational mentorship program and help teachers achieve an augmented, interactive educational formula. Students in the STOMP program score higher in math and science tests (NSF, 2010).

APPENDIX III: LEED FOR SCHOOLS CERTIFICATION

LEED for Schools offers 100 possible base points and 10 possible bonus points distributed among the categories below. The GBCI certifies projects according to the number of points achieved, earning either Certified, Silver, Gold, or Platinum status. The GBCI recognizes buildings that achieve one of these rating levels with a formal letter of certification (GBCI, 2011).

Sustainable Sites

Sustainable Sites specifies two prerequisites: Construction Activity Pollution Prevention and Environmental Site Assessment. The first prerequisite intends to reduce water, soil, and air pollution caused by construction activities. If the HSS is located in an existing school in an urban environment, airborne dust generation will be of greater concern than soil erosion or waterway sedimentation. The school site must pass a Phase I Environmental Site Assessment, and if contamination that may pose a risk to children's health is present, it must be remediated.

Additional Sustainable Sites credits can be earned under 16 related parameters. Many of these parameters are more relevant to new construction projects, however the site selection process should attempt to secure an existing space that satisfies as many of these credits as possible. For example, DSF should aim to choose an existing facility that already satisfies the Alternative Transportation credits. (Site selection criteria are discussed later in this report.) Additional credits are offered based on efficient Stormwater Design, Heat Island Effect mitigation technology, Light Pollution Reduction, Community Connectivity, and a comprehensive Site Master Plan.

Water Efficiency

According to the Department of Energy, over 200 million gallons of treated water could be saved every day by halving the 1 million to 3 million gallons that each of the 90,000 public schools in the United States consumes each year (US DOE EERE, 2009).

LEED for Schools projects must complete one prerequisite on WE Credit 3: Water Use Reduction to increase water efficiency by 20% (of a calculated baseline for the building) in order to reduce the burden on local water supply and wastewater systems. These calculations may only be based on water closets, urinals, lavatory faucets, showers, kitchen sink faucets and pre-rinse spray valves, and exclude water used for irrigation. LEED for Schools stipulates using WaterSense-certified fixtures and fittings where available, as well as alternative on-site water or graywater sources, and high-efficiency or dry fixtures (i.e., composting toilets). Projects that increase water efficiency by 30-40% can earn additional points under WE Credit 3: Water Use Reduction, and local water supply burdens can be reduced even further through WE Credit 4: Process Water Use Reduction.

The remaining points in Water Efficiency may be earned through

efforts in satisfying a Water Efficient Landscaping credit by reducing or eliminating potable or natural water usage for landscaping, and through Innovative Wastewater Technologies by treating wastewater on site, and using more water efficient fixtures and recycled water.

Energy and Atmosphere

LEED for Schools places a heavy emphasis on efficiency in energy systems by providing a possible 33 points in this area on top of three rigorous prerequisites. The first EA prerequisite, Fundamental Commissioning of Building Energy Systems, stipulates that the project team must designate an individual as its independent commissioning authority (CxA) to oversee the building of its energy-related systems to ensure proper installation, calibration, and performance. Commissioned systems include HVAC&R systems, lighting and daylighting controls, and renewable energy systems. The CxA should be engaged in the facility design process as early as possible. Projects are also required to establish a Minimum Energy Performance credit level compared to baselines using EPA's Target Finder tool, and to eliminate the use of CFC-based refrigerants in HVAC&R systems through the Fundamental Refrigerant Management credit. Extra possible points can be earned through EA Credit 3: Enhanced Commissioning of energy systems and EA Credit 4: Enhanced Refrigeration Management.

Up to 19 extra points are available through EA Credit 1: Optimize Energy Performance, for projects that go above and beyond the prerequisite Minimum Energy Performance level, and ongoing accountability of building energy usage will earn points through EA Credit 5: Measurement and Verification. Up to seven points may be earned using EA Credit 2: On-site Renewable Energy systems from wind, solar, biomass and bio-gas, low-impact hydro, and geothermal sources. Information on financing such projects may be available from local utilities or state energy offices. Projects that receive at least 35% of electricity through renewable energy contracts may earn points under EA Credit 6: Green Power.

Materials and Resources

The only prerequisite for Materials and Resources is the Storage and Collection of Recyclables credit, which requires buildings to reduce the waste sent to landfills by offering recycling of paper, corrugated cardboard, glass, plastics, and metals.

The eight additional Materials and Resources credits offer many potential areas to reduce materials and resource usage. Points are offered for maintaining existing building elements, such as existing walls, floors, and roof, and interior nonstructural elements such as doors and floor covering. These credits should be easy to obtain if the HSS is sited in an existing structure. Projects should develop and implement construction waste management plans to divert construction debris from landfills. Points are available for using building materials that are salvaged, refurbished, or reused (Materials Reuse); contain minimum

recycled content levels (Recycled Content), are sourced within 500 miles of the project (Regional Materials), and/or are made from plants that can be harvested in a 10-year or shorter cycle (Rapidly Renewable Materials). Points are also offered for using wood products that are certified by the Forest Stewardship Council (Certified Wood).

Indoor Environmental Quality

Indoor Environmental Quality is another significant component to LEED for Schools certification. Prerequisites achieve the Minimum Indoor Air Quality Performance credit through proper ventilation, the Environmental Tobacco Smoke (ETS) Control credit by prohibiting smoking in schools, and the Minimum Acoustical Performance credit by having quiet classrooms.

Fourteen additional credits are available in IEQ. Further ventilation measures are addressed in IEQ Credits 1 and 2, and indoor air quality measures are suggested during the construction phase and before occupancy (IEQ Credits 3.1 and 3.2). Enhanced Acoustical Performance builds on the Minimum Acoustical Performance requirement. IEQ Credit 4: Low-Emitting Materials addresses health issues concerning interior building materials such as adhesives and sealants, paint, flooring, wood, furniture, ceilings, and walls, while IEQ Credit 5: Indoor Chemical and Pollutant Source Control offers guidance to control outdoor pollutants that may reduce indoor air quality. The Mold Prevention credit is also emphasized through proper design and construction.

Both lighting and thermal systems are emphasized under IEQ. The Controllability of Systems credits offer potential to reduce energy requirements by allowing a high level of individual and group control over lighting and temperature settings. Achieving credits in Daylight and Views provides occupants with a connection to their outside environment.

Additional LEED Credits

Innovation in Design

Projects that seek to go above and beyond the LEED parameters may earn extra credits in Innovation in Design through various applications.

Regional Priority

USGBC has identified regional priorities in all areas of the country based on local conditions and needs. Projects can earn a maximum of four points by addressing four of six priorities for projects located in New York City (zip codes 10001-10280) (USGBC, 2011b).

APPENDIX IV: LEED FOR SCHOOLS CHECKLIST

(USGBC 2011)

LEED 2009 for Schools New Construction and Major Renovations

Project Checklist

Project Name

Date

Y	?	N			
Sustainable Sites				Possible Points:	24
Y			Prereq 1	Construction Activity Pollution Prevention	
Y			Prereq 2	Environmental Site Assessment	
			Credit 1	Site Selection	1
			Credit 2	Development Density and Community Connectivity	4
			Credit 3	Brownfield Redevelopment	1
			Credit 4.1	Alternative Transportation—Public Transportation Access	4
			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	2
			Credit 4.4	Alternative Transportation—Parking Capacity	2
			Credit 5.1	Site Development—Protect or Restore Habitat	1
			Credit 5.2	Site Development—Maximize Open Space	1
			Credit 6.1	Stormwater Design—Quantity Control	1
			Credit 6.2	Stormwater Design—Quality Control	1
			Credit 7.1	Heat Island Effect—Non-roof	1
			Credit 7.2	Heat Island Effect—Roof	1
			Credit 8	Light Pollution Reduction	1
			Credit 9	Site Master Plan	1
			Credit 10	Joint Use of Facilities	1
Water Efficiency				Possible Points:	11
Y			Prereq 1	Water Use Reduction—20% Reduction	
			Credit 1	Water Efficient Landscaping	2 to 4
			Credit 2	Innovative Wastewater Technologies	2
			Credit 3	Water Use Reduction	2 to 4
			Credit 3	Process Water Use Reduction	1
Energy and Atmosphere				Possible Points:	33
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
			Credit 1	Optimize Energy Performance	1 to 19
			Credit 2	On-Site Renewable Energy	1 to 7
			Credit 3	Enhanced Commissioning	2
			Credit 4	Enhanced Refrigerant Management	1
			Credit 5	Measurement and Verification	2
			Credit 6	Green Power	2
Materials and Resources				Possible Points:	13
Y			Prereq 1	Storage and Collection of Recyclables	
			Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 2
			Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
			Credit 2	Construction Waste Management	1 to 2

Y	?	N			
Materials and Resources, Continued					
			Credit 3	Materials Reuse	1 to 2
			Credit 4	Recycled Content	1 to 2
			Credit 5	Regional Materials	1 to 2
			Credit 6	Rapidly Renewable Materials	1
			Credit 7	Certified Wood	1
Indoor Environmental Quality				Possible Points:	19
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
Y			Prereq 3	Minimum Acoustical Performance	
			Credit 1	Outdoor Air Delivery Monitoring	1
			Credit 2	Increased Ventilation	1
			Credit 3.1	Construction IAQ Management Plan—During Construction	1
			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
			Credit 4	Low-Emitting Materials	1 to 4
			Credit 5	Indoor Chemical and Pollutant Source Control	1
			Credit 6.1	Controllability of Systems—Lighting	1
			Credit 6.2	Controllability of Systems—Thermal Comfort	1
			Credit 7.1	Thermal Comfort—Design	1
			Credit 7.2	Thermal Comfort—Verification	1
			Credit 8.1	Daylight and Views—Daylight	1 to 3
			Credit 8.2	Daylight and Views—Views	1
			Credit 9	Enhanced Acoustical Performance	1
			Credit 10	Mold Prevention	1
Innovation and Design Process				Possible Points:	6
			Credit 1.1	Innovation in Design: Specific Title	1
			Credit 1.2	Innovation in Design: Specific Title	1
			Credit 1.3	Innovation in Design: Specific Title	1
			Credit 1.4	Innovation in Design: Specific Title	1
			Credit 2	LEED Accredited Professional	1
			Credit 3	The School as a Teaching Tool	1
Regional Priority Credits				Possible Points:	4
			Credit 1.1	Regional Priority: Specific Credit	1
			Credit 1.2	Regional Priority: Specific Credit	1
			Credit 1.3	Regional Priority: Specific Credit	1
			Credit 1.4	Regional Priority: Specific Credit	1
Total				Possible Points:	110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

APPENDIX V: MAP DESCRIPTIONS

The Subway Accessibility map represents mean neighborhood accessibility to subway station in terms of distance. In order to calculate this measure, a raster grid of values for distance to subway (in feet) was created for the entire city of Manhattan. The zonal mean was then calculated for all the neighborhood projection areas in the city. The results can be interpreted as follows: an average distance to subway station of half a mile in a particular neighborhood means that from a random point in that neighborhood, it stands to reason that a resident will have to walk a half mile to the nearest subway. Accessibility by borough is fairly straightforward. Manhattan is very well connected; Brooklyn and the Bronx are both fairly well connected; Queens is not as well-connected; and Staten Island is the least connected via subway. High Schools from the 2006-2007 school year are pictured in the map as well. It can be inferred that certain schools are better served by mass transit than others. There are 311 public high schools pictured in total, although some may occupy the same physical plant.

One of the goals for High School for Sustainability is to be easily accessible by public transit. This map clearly illustrates the neighborhoods of New York City that are best served by subway stations.

Data used:
NYC DCP, 2011,
CommunityCartography by Halcrow, 2009, Columbia University, n.d.

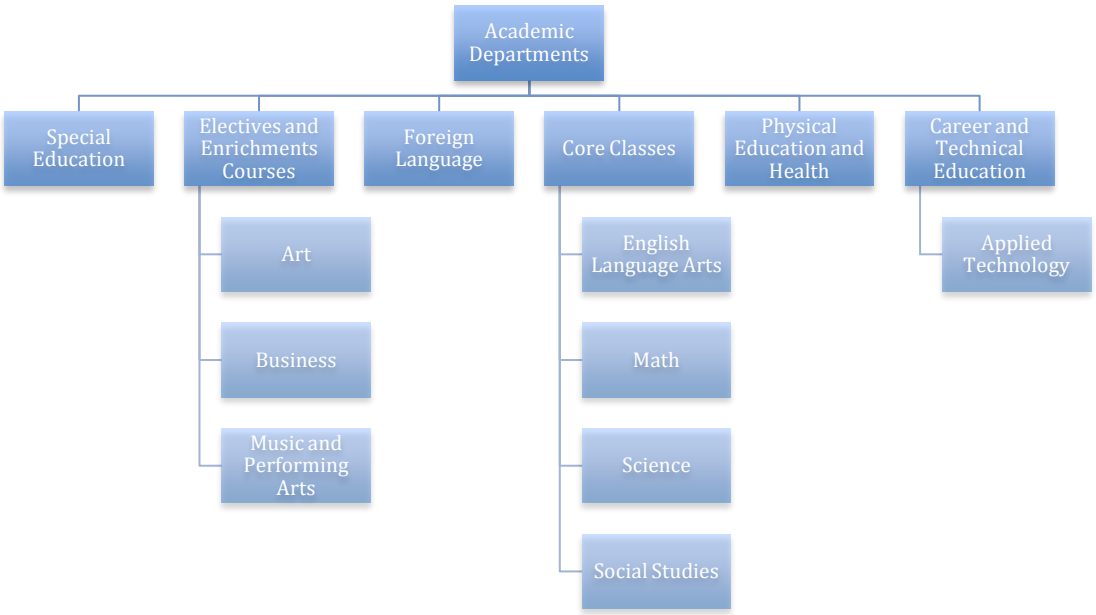
APPENDIX VI: ACADEMIC DEPARTMENTS

VI-A: The table lists the number of staff required to fill the corresponding roles according to academic department. Some staff may fill more than one role, which is especially important in the HSS's first-year.

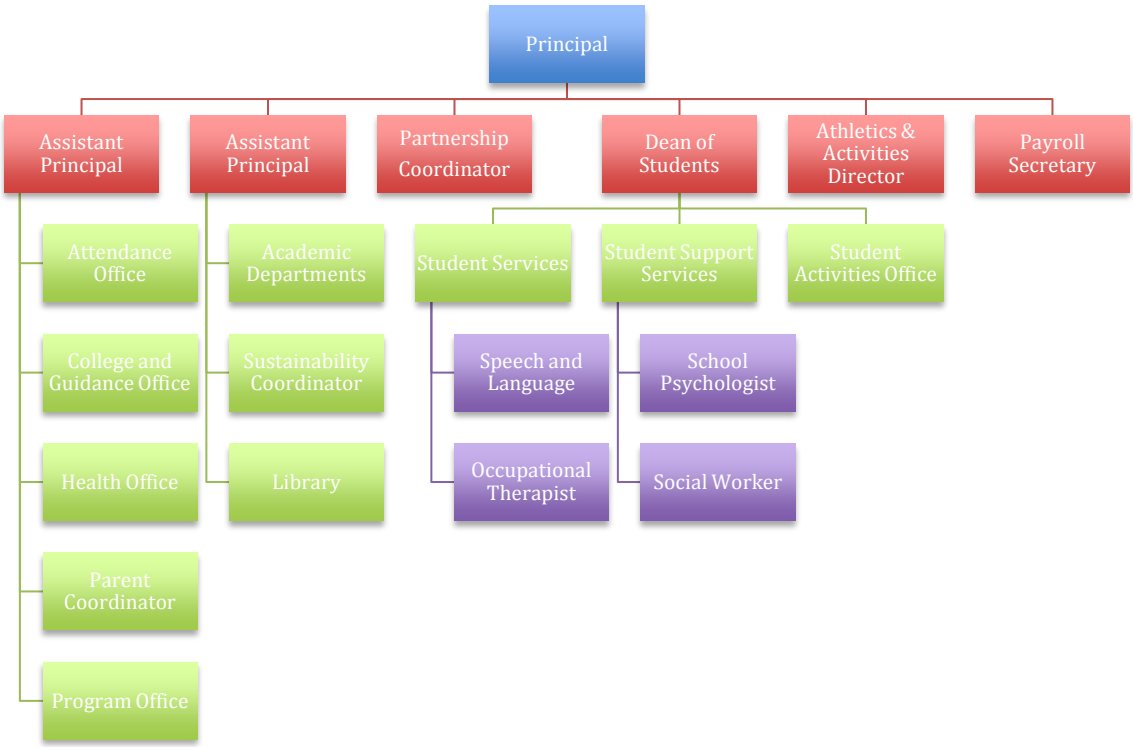
Table VI-A: Academic Departments	Number of Staff
Applied Technology	1
Art (Art Exploration, Photography)	1
Business	1
English Language Learners	2
Foreign Language	2
Language Arts	2
Math	2
Music and Performing Arts	1
Physical Education and Health	2
School to Careers - Career and Technical Education Courses	1
Science	3
Social Studies	1
Special Education	1
Total	20

APPENDIX VII: ORGANIZATIONAL / STAFFING CHARTS

VII-A: Sample Academic Organizational / Staffing Chart



VII-B: Sample Administration Staffing Chart



APPENDIX VIII: STAFF POSITIONS WITH HIERARCHY AND DESCRIPTIONS

1. Principal - Administration

Principal
The principal is the instructional leader of the school, responsible for setting its overall academic and professional direction. He or she receives assistance from the administrative assistant and the Principal's secretary.

Assistant Principal 1 (Student Personnel Services)
The Assistant Principal 1 is responsible for supporting the Principal, faculty, staff and student body. He or she is in charge of overseeing all student personnel services and is assisted by a secretary.

Assistant Principal 2 (Academic)
The Assistant Principal 2 supports the principal, faculty, staff and student body. He or she is in charge of academic departments, the school's sustainability program, and the library, with the assistance of a secretary.

Partnership Coordinator
The partnership coordinator is responsible for maintaining and cultivating an extensive network of corporate and non-profit partners. In a financially stressed environment, an Assistant Principal may fulfill this role.

Dean of Students
The Dean's Office aims to keep the school safe by upholding both the Chancellor's Discipline Code and the school's code of behavior.

Athletics and Activities Director
The athletic director oversees all physical education and extracurricular athletic activities. He or she is assisted by a secretary.

Payroll Secretary
The payroll secretary is in charge of the school's payroll.

2. Assistant Principal 1 - Student Personnel Services

Attendance Office
Student Accounting and Records Secretary
The records secretary and the staff in the attendance office are responsible for contacting parents/guardians to follow-up when a student is absent and communicating the importance of being present in school to students. Student accounting monitors the HSS's overall attendance statistics. The Assistant Principal 2 provides general oversight.

College and Guidance Office
In the College Office, student counselors guide the HSS seniors through the college application, scholarship and financial aid processes during individual counseling interviews, small group sessions and classroom visits. Visits from admissions representatives from colleges and universities are scheduled, and interested seniors are invited to attend the presentations. The College Office provides a library of books, software and college

catalogs to aid students in the college selection process.

Guidance Counselor 1 and 2

The Guidance Office offers a broad variety of student-centered services. Guidance counselors meet with students individually and in small groups to advise them regarding a wide variety of issues including academic requirements, college applications, and personal concerns. The counselors, with assistance from the College and Guidance Office secretary, manage student programs and carefully evaluate student progress in accumulating credits in each subject area sequence to satisfy diploma requirements.

Youth Development Coordinator

The youth development coordinator works with individual students and small groups to facilitate their social and emotional development. In addition to scheduled appointments, students are encouraged to visit counselors throughout the day for advice or reassurance.

Parent Coordinator

The parent coordinator serves as a liaison between staff and parents and community, shares information on school and/or DOE events, helps students become more involved in the community, and organizes workshops/seminars and other learning experiences.

Program Office

A teacher acting as a program chairperson ensures that the entire school is programmed accurately according to students' records and requests and in accordance with United Federation of Teachers (UFT) guidelines. Transcripts and report cards are two major ongoing projects for which the school relies on the Program Office.

3. Assistant Principal 2 - Academic

Sustainability Coordinator

A teacher acts as sustainability coordinator and is in charge of the sustainability curriculum.

Library

Librarian

The librarian is responsible for maintaining the school library and related records, as well as assisting students with research efforts. The librarian may also actively seek to procure the most updated collections through various efforts, including grant-writing.

4. Dean of Students

Student Services

Speech and Language

The speech and language worker assists students in developing their communication skills (See long-term planning section under “Additional Considerations” concerning providing services for English Language Learners).

Student Activities

Student Activities Coordinator

A teacher acting as student activities coordinator is in charge of all after-school, sports, student-led clubs, and student enrichment activities.

APPENDIX IX: GRANT OPPORTUNITIES

IX-A: Federal Grant Opportunities

Federal		
Government Grants	The agency postings provide a synopsis of the full grant announcement and 27 standard items of information, including a description of the program, due dates for applications, contact information and a link to the full grant announcement.	www.grants.gov
U.S. Department of Education, Office of Educational Technology	The primary goal of this program is to improve student achievement through the use of technology in elementary and secondary schools through competitive and formula grants. Additional goals include helping all students become technologically literate by the end of the eighth grade and, through the integration of technology with both teacher training and curriculum development, establishing research-based instructional methods that can be widely implemented.	http://www2.ed.gov/about/offices/list/os/technology/index.html

IX-B: State School Grant Opportunities

State School Grant Opportunities		
New York State Education	STEM and ELA Enrichment, Professional Development in Advanced Coursework and Leadership Academies. The NYC DOE is the recipient of ten Title IIB Mathematics Science Partnership (MSP) Grants from the New York State Department of Education.	http://www.p12.nysed.gov/funding/currentapps.html
The Fund for Public Schools	The Fund for Public Schools manages three grant programs to which New York City's public schools can apply: Legacy Libraries, Library REACH (Revitalizing Education for Adolescents and Children), and Arts SPACE (Supporting Performing Arts and Creative Education). These grant programs enable public schools from across New York City to enhance their school libraries and performance facilities.	http://schools.nyc.gov/FundForPublicSchools/ToolsforSchools/GrantApplications/default
The New York Community Trust	The goal of the Trust's Education Program is to ensure New York City's public schools prepare students for success in college and the workforce, and for participating in public life as creative and responsible citizens.	http://www.nycommunitytrust.org
United Way of New York City	The main focus of the United Way of NYC is to assist under-funded science departments in New York City public schools and help give students a better background in math and science.	http://www.unitedwaynyc.org/?id=17&pg=sti

Foundation Grant Opportunities		
Corning Incorporated Foundations	The Corning Incorporated Foundation develops and administers projects in support of educational, cultural, community and selected national organizations. Corning's areas of involvement in education have included community service programs for students, curriculum enrichment, student scholarships, facility improvement, and instructional technology projects for the classroom. Grants are primarily made toward initiatives, which improve the quality of life in and near locations where Corning Incorporated is an active corporate citizen.	http://www.corning.com/index.aspx
GE Foundation	GE Foundation grants encourage Northern Manhattan's extensive network of community organizations to work alongside local educators to develop a pilot program that will identify improvement strategies to significantly boost math and science performance. New York is the sixth city to participate in the Developing Futures program since 2005.	http://www.ge.com/foundation/developing_futures_in_education/new_york_city_ny.jsp
The Bay and Paul Foundations	The Bay and Paul Foundations, an independent private foundation located in New York City, is the product of the merger in January 2005 between The Bay Foundation and the Josephine Bay Paul and C. Michael Paul Foundation. Established in 1950 and 1962, respectively, the foundations were related organizations, each having distinct – though	http://www.bayandpaulfoundations.org/grants.html

	at times overlapping – program interests. As a result of their shared interests, the foundations occasionally jointly funded or collaborated on projects.	
The Blaustein Philanthropic Group	The Blaustein Philanthropic Group is a group of foundations created by Louis and Henrietta Blaustein. Each independently governed foundation represents a different branch of the Blaustein family and has a unique identity, set of priorities, and geographic focus. The foundations are united by their roots in Jewish tradition, and by their concern for social justice and equality of opportunity.	http://www.blaufund.org/foundations/mortonjanegrant_2010.html
The New York Life Foundation	Proposals must fall within the Foundation's Nurturing the Children focus, which includes educational enhancement, mentoring children, creating safe places to learn and grow and childhood bereavement. Preference is given to requests that provide an opportunity for volunteer involvement on the part of New York Life agents, employees and retirees.	http://www.newyorklife.com/foundation
Alfred P. Sloane Foundation	The Foundation is unique in its focus on science, technology, and economic institutions. A core belief of the Foundation is that the scholars and practitioners who work in these fields are chief drivers of the nation's health and prosperity. In each grant program, the Foundation seeks proposals for original projects led by outstanding individuals or teams.	http://www.sloan.org/
The Science House Foundation	Science House Foundation works in partnership with scientists and teachers to offer classroom science programs to schools around the world.	http://www.sciencehousefoundation.org/school-programs.html

APPENDIX X: SAMPLE OF SCHOOL BUDGETS

X-A: First Year School Budget

Fiscal Year 2011 Budget			Data Source GALAXY as of 3/25/2011	
27Q324 - Rkway Pk HS Environ Susta				
100-00 BEACH CHANNEL DRIVE, QUEENS,NY 11694				
Connolly, Jennifer				
Main School				
Section	Assignment		Positions	Budget
Leadership	AP - ORGANIZATION		1	$104,437
	INTERIM ACTING - PRINCIPAL		1	$132,636
Leadership Total			2	$237,073
Section	Assignment		Positions	Budget
Coordinator/Supervisor/Dean	PARENT COORDINATOR		1	$26,231
Section	Title		Positions	Budget
Secretary	SCHOOL SECRETARY		1	$52,250
Section	Subject	Type of Class/Service	Positions	Budget
High School Departments	ENGLISH LANGUAGE ARTS	WHOLE CLASS	1	$30,704
	ESL	WHOLE CLASS	0	$23,307
	MATH	WHOLE CLASS	1	$60,393
	PHYSICAL EDUCATION	WHOLE CLASS	0	$36,083
	SCIENCE - BIOLOGY	WHOLE CLASS	1	$60,393
	SOCIAL STUDIES	WHOLE CLASS	1	$60,393
	SPECIAL EDUCATION	WHOLE CLASS	1	$18,504
	VOCATIONAL	WHOLE CLASS	0	$30,021
High School Departments Total			5	$319,799
Section	Title		Positions	Budget
Guidance/Social Workers	F STATUS - GUIDANCE COUNSELOR		0	$25,593
Section			Positions	Budget
School Aides and Other Support Staff			1	$51,250
Section	Assignment			Budget
Per Diem	ABSENCE COVERAGE			$63,908
Section	Organizational Category			Budget
Per Session	AFTER/BEFORE SCHOOL STUDENT PROGRAMS			$62,574
	PUPIL PERSONNEL SERVICES			$7,144
Per Session Total				$69,718
Section	Title			Budget
OTPS	CURRICULUM & STAFF DEVELOPMENT CONTRACTS			$35,450
	EDUCATIONAL CONSULTANTS			$1,200
	EDUCATIONAL SOFTWARE			$18,691
	EQUIPMENT			$94,852
	FURNITURE (OBJECT 300)			$11,825
	LIBRARY BOOKS			$690
	NON-CONTRACTUAL SERVICES			$18,000
	SUPPLIES - GENERAL			$74,378
Main School				
Section	Title			Budget
OTPS	TELECOMMUNICATION CONTRACTS			$105
	TELEPHONE AND OTHER COMMUNICATIONS			$946
	TEXTBOOKS			$32,957
	TRANSPORTATION OF STAFF - NON-CONTRACT			$2,802
OTPS Total				$291,896
Section				Budget
Removals				$28,469
Section	Title			Budget
Set-Aside	SETASIDE FOR SSO SUPPORT			$27,000
Grand Total			**Positions**	**Budget**
27Q324			**10**	**$1,193,188**

Please note that this report excludes staff placed in excess pending placement or transfer elsewhere.

X-B: A Second Year School Budget

Fiscal Year 2011 Budget		**Data Source GALAXY as of 3/25/2011**		
03M402 - Urban Assembly School				
145 WEST 84 STREET, MANHATTAN,NY 10024				
RATHMANN NOONAN, ALEXANDR				
Main School				
Section	Assignment		Positions	Budget
Leadership	PRINCIPAL		1	$133,834
Section	Title		Positions	Budget
Secretary	SCHOOL SECRETARY		2	$80,969
Section	Subject	Type of Class/Service	Positions	Budget
High School Departments	ARTS-VISUAL	WHOLE CLASS	0.5	$28,327
	ENGLISH LANGUAGE ARTS	SUPPLEMENTARY	1	$62,486
		WHOLE CLASS	2	$113,308
	Sub Total		3	$175,794
	ESL	PUSH IN/PULL OUT	1	$68,317
	FL - SPANISH	PUSH IN/PULL OUT	1	$59,611
	MATH	SUPPLEMENTARY	1	$70,436
		WHOLE CLASS	2	$113,308
	Sub Total		3	$183,744
	Motorcycle, Marine and Outdoor Power Equipment	WHOLE CLASS	1	$56,654
	PHYSICAL EDUCATION	WHOLE CLASS	1	$56,654
	SCIENCE - BIOLOGY	WHOLE CLASS	1	$56,654
	SCIENCE - EARTH SCIENCE	WHOLE CLASS	1	$56,654
	SOCIAL STUDIES	WHOLE CLASS	2	$113,308
	SPECIAL EDUCATION	CTT – Special Ed Teacher	6	$339,925
High School Departments Total			20.5	$1,195,643
Section	Title		Positions	Budget
Guidance/Social Workers	SCHOOL SOCIAL WORKER		1	$72,273
Section	Assignment		Positions	Budget
Paraprofessionals	IEP-CRISIS MANAGEMENT(CIT)		1	$35,340
	TITLE I		1	$14,368
Paraprofessionals Total			2	$49,708
Section			Positions	Budget
School Aides and Other Support Staff			4	$114,033
Section	Assignment			Budget
Per Diem	ABSENCE COVERAGE			$12,379
Section	Organizational Category			Budget
Per Session	AFTER/BEFORE SCHOOL STUDENT PROGRAMS			$16,166
	PARENT INVOLVEMENT			$2,232
	PROFESSIONAL DEVELOPMENT			$56,146
	PUPIL PERSONNEL SERVICES			$1,537
	SUMMER STUDENT PROGRAMS			$1,425
Per Session Total				$77,506
Main School				
Section	Title			Budget
OTPS	CURRICULUM & STAFF DEVELOPMENT CONTRACTS			$12,500
	DATA PROCESSING REPAIR - CONTRACTUAL			$267
	EDUCATIONAL SOFTWARE			$955
	EQUIPMENT			$27,884
	FURNITURE (OBJECT 300)			$5,263
	LIBRARY BOOKS			$580
	NON-CONTRACTUAL SERVICES			$13,798
	SUPPLIES - GENERAL			$54,996
	TEXTBOOKS			$9,005
	TRANSPORTATION OF STAFF - NON-CONTRACT			$6,067
OTPS Total				$131,315
Section				Budget
Removals				$40,747
Section	Title			Budget
Set-Aside	SETASIDE FOR SSO SUPPORT			$29,500
Grand Total			**Positions**	**Budget**
03M402			**30.5**	**$1,937,908**

X-C: A Fully Operational School Budget

Fiscal Year 2011 Budget			Data Source GALAXY as of 3/25/2011	
17K547 - BKLYN. ACAD. FOR SCI. and ENV.				
883 CLASSON AVENUE, BROOKLYN,NY 11225				
PETERSON, VERONICA				
Main School				
Section	Assignment		Positions	Budget
Leadership	PRINCIPAL		1	$150,926
	AP - ORGANIZATION		0.22	$25,886
	AP - SUPERVISION		1	$101,369
Leadership Total			2.22	$278,180
Section	Title		Positions	Budget
Secretary	SCHOOL SECRETARY		2.25	$124,784
Section	Subject	Type of Class/Service	Positions	Budget
High School Departments	ARTS	SUBJECT SPECIFIC	1	$67,499
	CONFLICT RESOLUTION	SUBJECT SPECIFIC	1	$67,499
	ENGLISH LANGUAGE ARTS	CTT – General Ed Teacher	1	$67,499
		CTT – Special Ed Teacher	1	$67,499
		REDUCED CLASS SIZE	1	$67,499
		SUBJECT SPECIFIC	1	$79,078
	Sub Total		4	$281,574
	ENRICHMENT	CTT – Special Ed Teacher	2	$134,998
	ESL	PUSH IN/PULL OUT	0	$21,066
	FL - FRENCH	SUBJECT SPECIFIC	1	$67,499
	FL - SPANISH	SUBJECT SPECIFIC	1	$67,499
	LIBRARY	WHOLE CLASS	0.25	$16,875
	MATH	CTT – General Ed Teacher	2	$134,998
		SUBJECT SPECIFIC	3	$243,721
	Sub Total		5	$378,719
	MUSIC	SUBJECT SPECIFIC	1	$67,499
	PHYSICAL EDUCATION	SUBJECT SPECIFIC	2	$134,998
	SCIENCE - BIOLOGY	SUBJECT SPECIFIC	2	$134,998
		SUPPLEMENTARY	1	$76,762
	Sub Total		3	$211,760
	SCIENCE - CHEMISTRY	SUBJECT SPECIFIC	2	$134,998
	SCIENCE - PHYSICS	SUBJECT SPECIFIC	1	$86,026
	SOCIAL STUDIES	CTT – General Ed Teacher	3	$202,496
		SUBJECT SPECIFIC	1	$76,762
	Sub Total		4	$279,259
	SPECIAL EDUCATION	PUSH IN/PULL OUT	1	$67,499
		WHOLE CLASS	1	$67,499
	Sub Total		2	$134,998
High School Departments Total			30.25	$2,152,763
Section	Assignment	Type of Class/Service	Positions	Budget
Special Needs - Support Services	CONSULTANT TEACHER	PUSH IN/PULL OUT	4	$122,898
	SPEECH	PULL-OUT -all students	1	$74,622
Special Needs - Support Services Total			5	$197,520
Main School				
Section	Title		Positions	Budget
Guidance/Social Workers	GUIDANCE COUNSELOR		2	$175,149
Section	Title		Positions	Budget
SBST	DC 37 PARA (MORE THAN 20 HRS)		0	$30,402
	SCHOOL PSYCHOLOGIST		1	$95,194
SBST Total			1	$125,596
Section	Assignment		Positions	Budget
Paraprofessionals	CLASSROOM - General Ed		1	$37,508
	IEP-CRISIS MANAGEMENT(CIT)		1	$30,679
	INTERVENTION / PREVENTION		1	$37,837
Paraprofessionals Total			3	$106,024
Section			Positions	Budget
School Aides and Other Support Staff			2	$219,979

Section	Assignment		Budget
Per Diem	ABSENCE COVERAGE		$36,920
Section	Organizational Category		Budget
Per Session	AFTER/BEFORE SCHOOL STUDENT PROGRAMS		$57,166
	PARENT INVOLVEMENT		$328
	SUMMER STUDENT PROGRAMS		$15,771
Per Session Total			$73,265
Section	Title		Budget
OTPS	CURRICULUM & STAFF DEVELOPMENT CONTRACTS		$36,623
	DATA PROCESSING REPAIR - CONTRACTUAL		$8,624
	EDUCATIONAL SOFTWARE		$36,412
	EQUIPMENT		$13,325
	FURNITURE (OBJECT 300)		$1,445
	LIBRARY BOOKS		$2,682
	NON-CONTRACTUAL SERVICES		$14,998
	SUPPLIES - GENERAL		$40,290
	TELEPHONE AND OTHER COMMUNICATIONS		$300
	TEXTBOOKS		$34,271
	TRANSPORTATION OF PUPILS - CONTRACTUAL		$2,100
	TRANSPORTATION OF STAFF - NON-CONTRACT		$1,929
OTPS Total			$192,999
Section			Budget
Removals			$46,058
Section	Title		Budget
Set-Aside	SETASIDE FOR SSO SUPPORT		$39,225
Grand Total		**Positions**	**Budget**
17K547		**47.72**	**$3,768,463**

APPENDIX XI: PARTNERSHIPS

XI-A: Examples of Existing Partnerships with Current DOE Schools

Community-Based Organizations

Beacon Program
Friends of HSES
Stanley Isaacs Center (Reach for the Stars)
Harlem RBI
BiNet USA
Cloud Institute for Sustainability Education
Green Works
Institute for Student Achievement
Cloud Institute for Sustainability Education
Council on the Environment
Make the Road New York
Trees New York
Sebago Canoe Club
The Gateway Institute for Pre-College Education
Wave Hill
Rocking the Boat
The New York Bronx Botanical Garden (Bronx Green-Up)
Horizon Farm Project
Save the Sound
Bronx Power Alliance

Hospital Outreach

Woodhull Medical and Mental Health Center
St. Vincent's Child and Family Clinic Plus Program

Higher Education Institutions:
Eugene Lang College
Long Island University
New York City College of Technology
Columbia University
New York University
Columbia University Center for Ecological Research and Conservation (CERC)
John Jay College
University of Vermont
City University of New York (CUNY)
City of New York (CUNY) Law School
State University of New York (SUNY) Albany
SUNY College of Environmental Science and Forestry (ESF)
Hunter College
Brooklyn College
Queens College
Cornell University/Cornell Cooperative Extension

Cultural/Arts Organizations

Brooklyn Community Access Television (BCAT)
BRIC Rotunda Gallery
Arts for All
Open Stages at Lincoln Center
American Museum of Natural History
New-York Historical Society
Alvin Ailey American Dance Theater
New York Botanical Garden
Wave Hill

Not-for-Profit

New Visions for Public Schools
College for Every Student
Nature Network
Wild Metro
The Nature Conservancy Sponsors for Educational Opportunity

Student Conservation Association
New York City Public Library
Council on the Environment of New York City
New York Aquarium
National Outdoor Leadership School
Christadora

Corporate

DBRS Leveraged Finance
Waste Management Corporation

Other

City Parks Foundation
Urban Park Rangers
NYS Department of Environmental Conservation
Environmental Protection Agency
New York City Department of Parks and Recreation

XI-B: Examples of Existing Partnerships with Current Environmentally Themed Schools

Urban Assembly School for Green Careers

- The After-School Corporation (TASC)
- American Society of Landscape Architects
- Association of Energy Affordability
- Central Park Conservancy
- Consortium for Worker Education
- Cooper-Hewitt National Museum of Design
- CUNY New York City College of Technology
- The Durst Organization – (*Not Green / Involved in Green Work*)
- Green Order
- Green Schools Alliance
- Grow NYC
- Hecksher Foundation for Children
- Jonathan Rose Companies
- Morningside Heights/West Harlem Sanitation Coalition
- Natural Resources Defense Council
- The New School Department of Environmental Studies
- Nontraditional Employment for Women (NEW)
- NYC Department of Parks & Recreation
- NYS Department of Environmental Conservation
- Solar One
- Thornton Tomasetti, Inc. (*Architects*)
- United Puerto Rican Organization of Sunset Park (UPROSE) (UASGC, 2011)

High School for Environmental Studies (HSES, 2011)

Community-Based Organizations

- Friends of HSES

Hospital Outreach

- St. Vincent's Child and Family Clinic Plus Program

Higher Education Institutions

- Columbia University Center for Ecological Research and Conservation (CERC)
- John Jay College
- University of Vermont
- City University of New York (CUNY)
- State University of New York (SUNY) Albany
- SUNY College of Environmental Science and Forestry (ESF), Hunter College

Cultural/Arts Organizations

- American Museum of Natural History
- New-York Historical Society

Not-for-Profit

- The Nature Conservancy
- Sponsors for Educational Opportunity, Student Conservation Association
- New York City Public Library
- Council on the Environment of New York City
- New York Aquarium

Corporate

- 1010 WINS
- Toshiba America Foundation

Other

- Brookhaven National Laboratory

APPENDIX XII: LEAD PARTNERS

The table below lists intermediary organizations that may serve as potential lead partners for HSS (New York City's Changing High School Landscape pg. 19).

Characteristics of Intermediary Organizations Receiving Gates Funding

Intermediary Organization	Number of Gates Schools Established in NYC[a]	Geographic Focus	Organizational Focus	Started New Schools Before Gates NYC Funding
Asia Society	2	Regional/national	Cultural	No
Big Picture Learning	1	Regional/national	Education	Yes
City University of New York	6	New York City	Education	Yes
Coalition of Essential Schools	1	Regional/national	Education	Yes
The College Board	10	Regional/national	Education	No
Commonwealth Corporation Diploma Plus[b]	5	Regional/national	Workforce/youth development	Yes
Good Shepherd Services	1	New York City	Social service	Yes
Institute for Student Achievement	12	Regional/national	Education	Yes
Internationals Network for Public Schools	4	Regional/national	Education	Yes
Johns Hopkins University	3	Regional/national	Education	Yes
National Academy Foundation	3	Regional/national	Education	Yes
National Council of La Raza	3	Regional/national	Civil rights	No
New Visions for Public Schools	79	New York City	Education	Yes
NYC Outward Bound	6	New York City	Education	Yes
Replications, Inc.	8	Regional/national	Education	Yes
Urban Assembly	17	New York City	Education	Yes
Woodrow Wilson School National Fellowship Foundation	2	Regional/national	Education	No
Young Women's Leadership Network	2	Regional/national	Education	Yes
	165			

SOURCE: Gates funding records and intermediary characteristics from Policy Studies Associates, Inc.

[a]Indicates the number of schools that had ever received funding from the Bill & Melinda Gates Foundation as of the 2006-2007 school year.

[b]Diploma Plus is no longer part of Commonwealth Corporation. It became a separate organization in July 2009.

APPENDIX XIII: PERFORMANCE MANAGEMENT

School Environment – 15 Points

The first four measurements of School Environment (Academic Expectations, Communication, Engagement, and Safety and Respect) come from the results of the NYC School Survey and can earn up to 2.5 points each (NYC DOE, 2010a). Academic Expectations measures the school's degree of encouraging students to achieve high academic success. Communication measures a school's effectiveness in communicating its educational goals and requirements. Engagement measures the school's efforts in partnering with students, parents and educators to promote learning. Safety and Respect measures the physical and emotional security of a school's environment, which is directly linked to academic performance (NYC DOE, 2010a). Because these measures depend on survey responses, the HSS administration is accountable to the parents, teachers and students who answer the survey, and must actively work to meet needs in all four measures.

Attendance is another measure for which the HSS administration is directly scored. Student attendance throughout the total number of days on the school's academic calendar is given the most points (up to five) of all the measures within School Environment, and should be given significant attention (NYC DOE, 2010a).

Student Performance – 25 Points

Student Performance equally divides 25 points among four measures of graduation and advanced diplomas: Four-Year Graduation Rate, Four-Year Weighted Diploma Rate, Six-Year Graduation Rate, and Six-Year Weighted Diploma Rate (NYC DOE, 2010a). All measures indicate the percentage of students graduating in four to six years, with weights assigned to various types of diplomas, such as Local, Regents, Advanced Regents, Advanced Regents with Honors, and distinctions, such as CTE-Endorsement, Advanced Designation in Arts, and Associate's Degree (NYC DOE, 2010a). The HSS administration will benefit in advancing as many students as possible to graduate and receive any types of degrees.

Student Progress – 60 Points

Student Progress assigns the most points possible within the Progress Report in various stages of students' progression toward graduation (NYC DOE, 2010a). Out of a total of 60 points, up to five points are awarded each for the percentage of students completing ten or more academic credits at the end of the first, second, and third years of high school. The assessment of points in Student Progress indicates that the HSS administration should put its greatest efforts into ensuring completion of academic units and successful pass rates of Regents exams.

APPENDIX XIV: PERFORMANCE OF ENVIRONMENTALLY-THEMED HIGH SCHOOLS

School	Location	9th Grade Applicants	9th Grade Seats	9th Grade Acceptance Rate	Enrollment	% Overage	Attendance Rate	Graduation Rate 4-Year	Grade	Percentile Rank
Brooklyn Academy of Science and the Environment	Brooklyn	577	108	18.7%	446	6.3%	89.2%	72.1%	A	65%
Academy for Environmental Leadership	Brooklyn	332	108	32.5%	372	10.8%	77.1%	71.6%	A	89%
High School for Environmental Studies	Manhattan	3594	270	7.5%	1418	3.5%	90.0%	81.0%	B	49%
Gateway School for Environmental Research and Technology	Bronx	510	135	26.5%	506	11.3%	81.0%	45.2%	B	37%
Rachel Carson High School for Coastal Studies	Brooklyn	244	108	44.3%	471	5.1%	80.8%	64.9%	B	33%
Green School: An Academy for Environmental Careers	Brooklyn	359	116	32.3%	350	6.9%	77.5%	65.3%	C	10%
Academy of Environmental Science Secondary High School	Manhattan	326	105	32.2%	383	11.0%	81.6%	44.2%	F	1%
Academy for Conservation and the Environment	Brooklyn	197	81	41.1%	130	8.5%	82.9%	-	-	-
The Urban Assembly School for Green Careers	Manhattan	310	108	34.8%	95	10.5%	84.8%	-	-	-
Rockaway Park High School for Environmental Sustainability	Queens	-	150	-	-	-	-	-	-	-

Source: 2009-2010 NYC Progress Report ("NYC Progress Report" NYC DOE 2011)

Definition of Key Terms and Acronyms

Advanced Regents Diploma – An advanced New York City high school diploma, which requires passing an additional science, math, and foreign language Regents exam.

A/V – Audio/visual

CFC – Chlorofluorocarbon

Charter Schools – Public schools whose policies, programs and resources are managed by not-for-profit boards of trustees on performance contracts, not by NYC DOE. Charter schools admit students by lottery.

Common Core Standards – Standards created in part to supplement the State's application to the Race to the Top grant program, with literacy across all subjects as their basis for learning. They span all grade levels, from kindergarten through 12th grade.

Consortium Schools - Schools that use performance-based, not examination-based, assessments, and are exempt from all Regents examinations except for English. These exams are replaced with a portfolio that a student creates throughout his or her high school career, presenting this work to a panel of teachers who judge the work and deem it acceptable for graduation. This frees teachers from "teaching to the test" and allows students to explore individual interests.

CTE – Career and Technical Education programs focused on providing technology and engineering skills applicable for professional careers.

DOE – NYC Department of Education

DSF – DOE Department of School Facilities

ELL – English Language Learners

EPA – U.S. Environmental Protection Agency

Extended Learning – Learning that occurs outside the standard HSS curriculum and includes additional internships, mentorships, after-School programs, summer school and environmental Clubs.

Green Jobs – Careers associated with environmental and sustainable fields, including businesses that produce goods or provide services that benefit the environment or conserve natural resources, and/or make their establishment's production processes more environmentally friendly.

Green Schools – School buildings or facilities that are LEED certified, include sustainable features and promote academic and healthy environments while reducing

economic and resource consumption.

Higher Education – Educational opportunities pursued after high school, such as continued learning programs, certifications, workshops and degrees at associate, bachelor's, master's, and PhD levels.

HSS – High School for Sustainability; a high school that exposes students to concepts of sustainability within a tailored curriculum and a physical environment in which the school facilities reflect and embody sustainable features. The direct goal of the school is to equip its graduates with a legacy of sustainability through academic success and development of environmental career skills. Similarly, the long-term goal is to promote sustainability on a broader scale.

HVAC – Heating, ventilating, air conditioning

HVAC&R – Heating, ventilating, air conditioning and refrigeration

Incubator – A temporary space appropriate for the first year or two of a school, during which time a larger permanent space would be identified and contracted.

Lead Partner/ Intermediary Organization – An organization that assists the opening of a new school at all stages of the process.

LEED – USGBC's Leadership in Energy and Environmental Design green building ratings system

LL86 – Local Law 86, signed by Mayor Bloomberg on October 3, 2005, requiring any new capital projects that involve building construction and receive city funds to be built in accordance with the standards of the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) green building ratings system.

NCLB – No Child Left Behind; a law signed by President Bush in 2001 that requires states to independently determine educational standards used to measure student and teacher performance. The central idea is for every student to be proficient in the core subjects, with a special focus on literacy.

New District High School Application Process – Application process to open a new DOE high school which requires meeting specific requirements, such as open house and workshop attendance, a letter of intent, a prospectus, a notice of intent, and a detailed application.

Net Zero Energy – A description of buildings whose energy consumption and carbon emissions amount to zero. This is achieved through application of energy efficiency techniques and use of renewable energy sources.

NSF – National Science Foundation

NYC DOE Sustainability Initiative – An initiative to promote sustainability within NYC DOE school districts. Directed by a sustainability team within the Division of School Facilities

(DSF), and supported by the DOE Sustainability Committee (composed of various DOE divisions, other governmental and public agencies, and non-profit organizations).

NYS – New York State

PlaNYC – A comprehensive city-wide plan to incorporate sustainability in various New York City functions in order to achieve 10 sustainable goals, including reduction of greenhouse gas emissions by 30%.

Regents Examinations – New York City high school exams that test competency and completion of specific core subjects. In order to receive a high school diploma, a student must attain a score of 65 or higher on a series of 5 Regents Exams

Screened or Selective Schools –DOE high schools that use tests or other screening methods to choose students.

Small Schools – Schools with a maximum enrollment of 550 students, with no more than 175 incoming 9th grade students. These schools often have a central curricular theme and form partnerships with non-profits, institutions and business for enriched educational opportunities.

Specialized Schools – Nine NYC DOE high schools established under New York State Law (2590 – Section G) that are highly selective, requiring entrance exams or auditions.

STEM and STEM ICT – Science, Technology, Engineering and Math, and Information and Computer Technology; programs meant to provide more rigorous standards in these subject areas.

Sustainability – A balanced way of human interaction with the earth that allows humans to meet present needs of social, economic, and ecological development without compromising the needs of future generations.

Sustainability Research Workshops – Four year-long research projects that will be built around a two-track system and encourage students to use analytical, technical and engineering skills for practical applications; unique to the HSS curriculum.

Two-Track System – Students are separated into two specialized curriculum tracks, taking similar classes, or potentially the same classes, but with two different goals. One track would be for students planning to attend higher education, and the other would be to prepare students for a career in green fields.

Unscreened Schools – NYC DOE schools that randomly select their student body by computer.

USGBC – U.S. Green Building Council

Milestones and Master Calendar

The first fast approaching milestone and deadline will be to submit a Letter of Intent (LOI) to DOE. Exact deadlines have not yet been published but it is expected that the LOI is due in early October 2011.

To be ready for this deadline and the encompassing design and development workshops DSF should have its school leader and leadership team in place. The Leadership Team can undergo changes throughout the process but it is quite important the school leader remains committed throughout the process.

This fall, after deadlines have been published and workshops begin, DSF's leadership team should begin to formulate its own detailed master calendar and milestones. The master calendar is a conceptual model for the readers to utilize in planning for the upcoming design and development workshops and to understand some of the basic requirements and their temporal spacing over the next year.

Note: The dates on the master calendar are speculative (based on the Fall 2010 timeline). It is imperative that the HSS leadership team remain in contact with DOE's new schools personnel to ensure that deadlines do not change and are not missed.

Master Calendar (speculative)	
June	**Find School Leader**
July	Put Together New School Team
August	Reach out to Potential Strategic Partners
September	New School Process Open House
	Mentor School Process Open House
	1st Design & Development (D & D) Session
October	**Letter of Intent Due**
	2nd D&D Session
	Submit Drafts of Application Parts I & II for Targeted Feedback
	3rd D&D Session
	Targeted Feedback Sessions (by appointment only)
	Approvals Announced for Round II
November	5th D&D Session
	Second Round of Targeted Feedback (by appointment only)
	6th D&D Session
	7th D&D Session
	Approvals Announced for Application Submission
November	**Completed applications due**
December	Interview Decisions Announced
	Interviews
January	**Final Decisions Announced**
In Consultation with DOE	Determine School Location
February	Begin Hiring Process
March	Recruit Students
September 2012	**School Starts**

Bolded Sections denote Important Milestones.