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FEMA's Pathway to Resilience

Brittany J. Hood[1]

Abstract: *The purpose of this paper is to explore the Federal Emergency Management Agency's (FEMA) past decade of mitigation weaknesses and areas of improvement during Hurricane Katrina, the Northridge Earthquake, and Hurricane Ike. This outlines which best practices have been ignored, utilized, and forgotten through FEMA's mitigation efforts. Primarily the National Response Framework (NRF) has been placed on the backburner throughout the years despite a prior big push to implement the steps outlined by the NRF into all emergency responses. Mitigation efforts have made successful strides with the assistance of the new FEMA Director, Craig Fugate. Past and current FEMA directors are evaluated along with the roles that those individuals have played in historical natural disasters. Previous FEMA directors such as Robert Paulison and Michael Brown had limited emergency management expertise and misled FEMA, which became evident as natural disasters unfolded in the last decade that showed a lack of preparedness and planning on FEMA's part. Craig Fugate is the most recent FEMA Director and holds the knowledge that can bring future success to FEMA. In addition, this paper suggests where improvements can be made in regard to mitigation and examines what FEMA has done to improve itself throughout the years.*

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Mitigate, prepare, respond, and recover. These are the four steps of emergency management where agencies focus their mission statements. Specifically, FEMA's mission is to "support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards" (FEMA, 2013). Over the last 10 years FEMA has undergone scrutiny for a lack in preparedness and utilization of mitigation best practices in a variety of natural disasters. The agency has undergone a variety of developments in the last decade that have led to an improvement in their focus, particularly in mitigation. This paper explores FEMA's role in Hurricane Katrina, the Northridge Earthquake, and Hurricane Ike in an effort to establish where FEMA's mitigation practices went wrong, what their successes were, and what they are doing to improve and become more resilient as an emergency management agency.

Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters (FEMA, 2013). In every facet of FEMA's mission, be it preparedness, response or recovery, mitigation is applied. That being said, it is important that best practices be utilized and that the agency be flexible and adaptive. This year alone, there have been a total of 85 disaster declarations. This is the lowest number since 1997. Does this mean that FEMA has defined which procedures and processes are classified as best practices? There are many forms of mitigation, all of which are dependent upon the type of disaster anticipated. Generally, mitigation entails a risk analysis, a risk reduction, and national flood insurance plans (FEMA, 2013). Specifically mitigation involves: having current building codes that can withstand disasters that threaten the area; development of regulations, such as zoning and subdivision ordinances; capital improvement programs; land and property acquisition, taxation and fiscal policies that persuade

home buyers to build in less hazardous areas; and public awareness (Schwab, Eschelbach, & Brower, 2006).

FEMA has many grant programs to fund mitigation. Under the Hazard Mitigation Assistance (HMA) Program there are the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA) programs. HMGP provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. PDM provides annual funding for mitigation planning and projects in order to partially free up federal money. FMA is another annual fund that reduces or eliminates risk of flood damage to buildings insured under the National Flood Insurance Program. Additionally there are the Repetitive Flood Claims (RFC) and the Severe Repetitive Loss (SRL) grants. The RFC was created for insured individuals with one or more claims for flood damage in an effort to "reduce or eliminate the long-term risk of flood damage". Finally the SRL grant program is for individuals with four or more claims for flood damage (FEMA, 2014).

FEMA's failures and successes are evident in their responses to Hurricane Katrina, the Northridge Earthquake, and Hurricane Ike. In order to improve, an agency must be aware of their weaknesses. Delving into the activities of the aforementioned disasters will allow readers to see the progress FEMA has made over the last decade. When Katrina swept through the Gulf, FEMA was in the initial stages of transitioning to under the Department of Homeland Security's (DHS) umbrella along with 21 other agencies. Their goals, values, and mission statement were compromised as FEMA was absorbed into DHS. The increased focus on terrorism after 9/11 terrorist attacks diminished the planning and mitigation efforts by FEMA with respect to natural disasters. Mitigation was not forefront primary goal for FEMA at this time; their efforts were

focused more towards combating terrorism. FEMA Director Michael Brown was the poster child of unpreparedness and lack of planning through poor on-sight management during Hurricane Katrina. When Katrina hit on September 29, 2005 DHS had been fully operational for almost three years, since early November 2002. FEMA was incorporated into DHS as a stand-alone agency adoption, with all the moving parts in place since 1979. When DHS took FEMA under its wing, they accepted the responsibility of some of FEMA's anti-terrorism responsibilities. Director Brown dropped the ball and the consequences and repercussions were evident as the events of Hurricane Katrina unfolded.

While FEMA was not entirely to blame for the lack of effective mitigation in the aftermath of Katrina, they did hold some fault. Some mitigation efforts were attempted; for example, there was a practice hurricane exercise called Hurricane Pam, prior to Katrina. Interestingly enough, the second portion of the exercise was never completed. It is difficult to say if the second portion of the Pam exercise would have set mitigation in motion or not. The Hurricane Pam exercise did not predict that the levees would not withstand the extreme flooding of Katrina. Risks and warnings to New Orleans were not acknowledged and mitigation concerns were left unattended. Some FEMA officials, including Joe Allbaugh and other engineers, echoed concerns for the city (Parker, Stern, Paglia, & Brown, 2009). Previous hurricanes that had threatened the city left trepidations about the future resilience of New Orleans. Mitigation efforts need to be all encompassing. In the case of considering a hurricane where flooding is likely, levees should not have been overlooked. This is especially the case in this instance, because it was common knowledge that New Orleans sits below sea level. The Army Corps of Engineers attempted to stabilize levees. However, Mayor Nagin allocated a large portion of the federal dollars toward other projects that forced the levees to be placed at a lower priority. Following the

debacle with Katrina, Michael Chertoff told EHS Today that, “FEMA’s logistics systems ‘simply were not up to the task of handling a truly catastrophic event. FEMA lacks the technology and information management systems to effectively track shipments and manage inventories’” (Smith, 2006).

The Northridge Earthquake showed some of FEMA’s weaknesses and strengths. Building codes were not up-to-date to withstand the 6.7 magnitude earthquake and potential damage was not accurately assessed. A main issue that arose from this disaster was the welded steel moment resisting frame system of California structures, which is constructed in buildings so as to resist the symptoms of earthquakes. However, FEMA did make several satisfactory decisions when handling Northridge. In conjunction with the California Office of Emergency Services (OES), they opened 20 Disaster Application Centers.

The response time to Hurricane Ike was much swifter than with Katrina, partly due to the Fusion Centers that were created in response to Hurricane Katrina in 2006. According to DHS, Fusion Centers “serve as focal points within the state and local environments for the receipt, analysis, gathering, and sharing of threat-related information between the federal government and state, local, tribal, territorial and private sector partners” (DHS, State and Urban Area Fusion Centers, 2013). During both Hurricane Ike and the Northridge Earthquake, the National Response Framework (NRF) was available and had transitioned from the National Response Plan (NRP). The NRF is a set of guided principles for emergency management agencies to create a timely uniformed response.

However, “Some instances decisions were made outside of the NRF command and control structure”, this caused an overabundance of ice and “base camp capacity exceeded demand” (FEMA, 2009). If FEMA had utilized NRF, they would have saved almost $18 million

dollars. FEMA did not communicate at the local level in regards to gathering resources such as water and ice. In addition, the Disaster Recovery Centers were opened for an inappropriately extended amount of time. FEMA directly stated in their *Management Advisory Report: FEMA's Response to Hurricane Ike*, that they needed to reinforce the key principles of the NRF, and strengthen the authority of regional and joint field office (JFO) emergency managers to manage disasters at the lowest possible level within the unified command structure. Overall, the response to Ike was successful despite the few expensive mistakes. Moving forward, improved communication and adherence to the NRF are keys to success, especially in adherence to Emergency Support Functions (ESF) #2 (Communications), ESF #5 (Information and Planning), and ESF #7 (Logistics) in the report.

FEMA will not always be the least respected agency under DHS. Their mistakes have been under scrutiny intermittently for at least the last decade, but they have made successful attempts to improve.. On February 6, 2013 FEMA participated in a "Think Tank" conference that included over 800 people via telephone and Twitter. Craig Fugate, FEMA Administrator, set goals to bring a Whole Community Approach to emergency management. This ne Some of the ideas pertinent to mitigation include: the use of new backup communications systems in disaster zones, discussion of electrical alternatives for individuals that use power dependent medical equipment, and collaboration on increasing efficient evacuations (FEMA, 2013). Janet Napolitano, the recent Secretary of the Department of Homeland Security said that FEMA has founded the FEMA Corps, DHS Surge Capacity Force, and innovation teams (Napolitano, 2013). FEMA Corps aim their effort towards mitigation work and DHS Surge Capacity Force has their efforts focused on the response phase. The FEMA Rumor Control Initiative also was established in the past year in an effort to abolish rumors in social media and disseminate the truth.

Hurricane Sandy was one of the first disasters that FEMA attacked with a Whole Community focus. Implementation of the Whole Community approach was there, but the follow through was not present in this case. Unfortunately FEMA still struggled with implementing the NRF and coordinating with state and local agencies. FEMA was able to successfully integrate an online crisis management system that allowed for coordination of federal response operations (DHS, Hurricane Sandy FEMA After-Action Report, 2013). In addition, FEMA also distributed Flood Hazard Mapping for areas that would be threatened by Sandy and urged citizens to purchase flood insurance. In the aftermath of Sandy's destruction, FEMA offered rebuilding tips that explained the concerns of building in areas that are most vulnerable to disaster.

FEMA has made great strides in a multitude of areas. First, in an effort to redirect FEMA's focus as an emergency management agency under control of a DHS, the Post-Katrina Emergency Management Reform Act was passed. Now FEMA has a clear mission which again includes mitigation and preparedness. In addition, at the time of Hurricane Katrina the National Response Plan (NRP) was not completed, currently however it is finished and has been renamed the National Response Framework. Since mitigation occurs in all aspects of emergency management, it is critical to understand the importance of utilizing After-Action Reports (AARs). By reviewing AARs, FEMA and other emergency management agencies can reflect on occurrences surrounding the disaster and highlight strengths and areas of improvement. This allows FEMA to see how their actions impacted outcomes, and to recognize patterns and trends in an effort to improve (FEMA, 2008).

More importantly, employing a director of FEMA who leads by example is a new strategy that is proving successful. Craig Fugate was an exceptional choice as the new director. Early in his emergency management career, he was a volunteer firefighter, paramedic and a

Lieutenant of Alachua County Fire Rescue. Later Fugate became the Emergency Manager for Alachua County in Florida, and then was the Bureau Chief for Preparedness and Response and the Chief of the State Emergency Response Team. Under Fugate's management this is the first time FEMA has implemented a whole community approach to emergency management, which allows for incorporation of local and state voices in federal-level emergency management. Fugate has extensive experience as a first responder, thus bringing a fresh and under-utilized perspective to FEMA.. His repertoire of experience in managing the hurricane-prone state of Florida as Emergency Management Director supplied knowledge and expertise in areas that FEMA was lacking in prior years. The prior two directors were Robert Paulison and Michael Brown, neither of whom played significant roles as first responders. Paulison was the Chief of Miami-Dade Fire Rescue Department. Brown's resume was limited to "Assistant City Manager with emergency services oversight" in Oklahoma (Fonda & Healy, 2005).

FEMA has a plethora of mitigation planning guides at their disposal. These guides cover the spectrum of mitigation. FEMA appears to be improving in the area of flexibility and adaptation in many ways, including obtaining new materials for improving mitigation practices. Of the 16 planning guides available, 3 were updated in 2013 and 1 guide was introduced just this year. The most recent introduction to the library of mitigation guides was the *Local Mitigation Planning Handbook* (FEMA, 2013). Once again, it is important to utilize best practices; however, they are only the best until a better practice is discovered. When that time comes, replacements must be made which is evident in the FEMA Mitigation Planning Guide library (FEMA, 2013b) on their website.

There is still room for improvement within FEMA. With a decreased pre-disaster mitigation budget (FEMA, 2012), this can prove to be difficult. However, there are problems that

can be tackled that do not call for expending budget money. For example, relationships with first and second responders need to be enhanced; Fugate's past experiences give him the knowledge and ability to do so. The NRF is a guiding standard for how to implement a Whole Community Approach to emergency management, and following its principles would greatly decrease the weaknesses that are debilitating to FEMA. Utilization of NRF principles needs to be increased because NRF was created to aid in response and recovery, and FEMA is selecting when and what they practice. Past failures as recent as Hurricane Sandy indicate the need for further training in Emergency Support Functions: Communications (#2), Information and Planning (#5) and Logistics (#7).

In terms of the Systems Approach, improvements within FEMA will only lead to a butterfly effect: as improvements are made they will begin to effect other areas causing further improvement. As FEMA develops their skills it would allow for improved relations with first responders and other agencies that are important to the emergency management scene. Improvements would assist in reaching goals that are rooted in the mission FEMA established: lessening the impact of disasters.

FEMA assessed needed improvements in the *FEMA Strategic Plan Fiscal Years 2011-2014* (FEMA, 2011). Mentioned is a need to be flexible and adaptive in FEMA's practices, foster a Whole Community Approach to Emergency Management Nationally, build the nation's capacity to stabilize and recover from catastrophic events, build unity of effort and common strategic understanding among the emergency management team, and to enhance FEMA's ability to learn and innovate as an organization (FEMA, 2013). Current news releases from FEMA are overwhelmingly mitigation focused, and so they should be given that every dollar spent on mitigation saves $4 in the event of a disaster (FEMA, 2012). FEMA's main focus at this time is

to “rebuild stronger”. In an effort to include all interested parties, DHS and FEMA collaborated to implement the Homeland Security Enterprise to reach out to all stakeholders including local, state, regional, federal, private and non-governmental organizations (NGOs). Every disaster is local; we need to foster resilience so our communities can withstand and survive disaster. Resilience is our nation’s emergency management goal and FEMA offers tips to accomplish this. In summation, FEMA has come far in the last decade. They have learned from some of their mistakes during Hurricane Katrina, the Northridge Earthquake, and Hurricane Ike. There are still areas of weakness that Fugate is working to improve. The NRF should be of utmost importance on FEMA’s pathway to resilience. More development will come through After-Action Reports and improving relations with first responders. As rudimentary skills are developed and improved, FEMA will continue to regain respect from the people they serve.

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Education: the world, the United States and Indianapolis

Rachel Ogorek[2]

Abstract: *One of the current societal issues plaguing America is the downfall of America's public education system. On national, state, and local levels American students struggle to remain competitive in a global market. Students that come from minority and lower socioeconomic backgrounds are even more at risk of being able to compete in an ever-competitive job market. While there is not a one-size-fits all approach to solving this crisis, one promising solution involves increasing access to Science, Engineering, Mathematics, and Technology (STEM) education; especially for minority and underserved student populations. This paper briefly examines examples of successful STEM programs in other urban areas similar to Indianapolis as well as one successful STEM school in Indianapolis.*

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In 2009, students from the United States participated in an international education test given by the Programme for International Student Assessment (PISA), which is a part of the Organisation for Economic Co-operation and Development (OECD). This organization administers tests to 15-year-old students in multiple nations. Fifteen-year-old students have the most similar curriculum internationally of any age and thus provide the most closely related skill sets to be able to test standards in international education across the board (Wilkens, 2011). Student performance is measured in mathematics, science, and reading. The test was first performed in 2000 and repeated every three years. It is given to collect data on student performance so that education policies and outcomes may be improved. "The data has increasingly been used both to assess the impact of education quality on incomes and growth and for understanding what causes differences in achievement across nations" (Hanushek & Woessmann, 2011). In 2009, 470,000 15-year-old students representing 65 nations and territories participated in PISA (OECD, 2012).

Out of the 34 developed countries that took this test, the United States scored fourteenth in reading, twenty-fifth in math, and seventeenth in science (Neil, S., 2011). While these facts are disheartening, they are even more alarming when the amount of education money spent per individual is calculated. According to the United States Department of Education in 2008, the U.S. spent $10,441 per student. In 1971, the U.S spent $4,552 per student (These monetary values account for inflation) (U.S. Department of Education, 2012). The United States spends more per student on elementary and secondary education than all but three other countries: Luxembourg, Switzerland, and Norway (Ripley, 2010).

In spite of the fact that America has more than doubled the amount of money it spends on education, the United States continues to lag behind in academic performance in multiple

categories when compared to other nations (Education Olympics, 2012). Not only does the Unites States score below average or average on the PISA test, results indicate that academic achievements for American students have remained stagnant for many years while student achievements in countries like Latvia, Chile and Brazil have made gains in academics three times faster than American students (Hanushek et al., 2012). Students in Portugal, Hong Kong, Germany, Poland, Liechtenstein, Slovenia, Colombia and Lithuania have improved academically at twice the rate (Hanushek et al., 2012). This is distressing given the amount of money, time, policies and energy that are put into the American educational system.

The Council on Foreign Relations compiled a U.S. Education Reform and National Security Task Force. Led by former New York City schools' Chancellor Joel I. Klein and former U.S. Secretary of State Condoleezza Rice, the task force found **"**The United States' failure to educate its students leaves them unprepared to compete and threatens the country's ability to thrive in a global economy. Educational failure puts the United States' future economic prosperity, global position, and physical safety at risk" …[the country] "will not be able to keep pace—much less lead—globally unless it moves to fix the problems it has allowed to fester for too long" (Klein et. al., 2012). Given these dire warnings, what can the United States do to ensure that it is able to maintain its ability to compete globally in the future?

It is clear that education in the United States needs improvement. One individual working tirelessly to see that the United States maintains its competitive edge is Eric Alan Hanushek. Hanushek is a Paul and Jean Hanna Senior Fellow at the Hoover Institution of Stanford University and an expert on educational policy and the economics of education. He and his colleagues know that as a whole our nation is in trouble; only six percent of students in the United States perform at the advanced-proficiency level in mathematics. American students rank

behind children in 30 other countries ranging from the United Kingdom to Taiwan (Ripley, 2010). Hanushek and his colleagues broke down each state and compared them to the rest of the world's educational rankings in mathematics as if they were their own separate countries. The goal was to see if any American students competed at the top of the rankings (Hanushek et.al, 2012, Is the U.S. catching up). Sadly, no individual state even entered the top ten. The highest performing state, Massachusetts, came in at number17. The highest achieving students in Indiana rank 42 places behind Massachusetts and 12 places behind the United States average (Peterson, 2010).

When education achievements in Indiana are broken down into cities, Indianapolis fares much worse than the top performing students in Indiana. Indianapolis schools have been under scrutiny for some time now and they have tried multiple reforms to reign in their abysmal graduation rates. In 2007, Indianapolis had the second worst performing school district in the Midwest, coming in just ahead of Detroit (Biddle, 2012). Indianapolis Public Schools face a significant number of problems and produce a disproportionately lower number of graduates than the rest of Indiana and the United States at large.

In 2005, Indianapolis Public Schools began implementing Promoting Power initiatives. Promoting Power compares the number of twelfth-grade students in a school to the number of ninth grade students three years earlier. This is designed to estimate the proportion of high school students who make it to their senior year (Promoting Power Faq's, 2013). Between 2005-06 and 2010-11, the five-year graduation rate in Indianapolis Public Schools declined from 41 percent to 38 percent even with the district's Promoting Power initiatives (Biddle, 2012). In 2008 only 48.6 percent of students graduated from Indianapolis Public Schools (Profile for Indianapolis Public Schools (School District), 2012). The percentage of Indianapolis public high school students

taking Advanced Placement courses declined from 2.4 percent in 2006-07 to 1.4 percent in 2009-10, according to the U.S. Department of Education's Civil Rights database (Biddle, 2012). Another measure for high academic achievement is the International Baccalaureate Diploma Program. This program is an intense curriculum for high school juniors and seniors, with an emphasis on intercultural understanding and enrichment (What Is the International Baccalaureate, 2013). Only 10 students in the entire district took International Baccalaureate courses in 2009-10 (Biddle, 2012).

These negative statistics have brought attention to the turmoil in Indianapolis schools. There appeared to be some success in graduation rates as Indianapolis Public Schools reported a graduation rate of 64.6 percent in 2011 (Elliot, 2012). However, this was quickly denounced because of a waiver system. Every year high school seniors are required to take algebra and English standardized tests indicating that they are proficient in these subjects so that they may graduate. Students must receive a score of at least 51 percent to obtain their diploma. A waiver system was implemented to allow students who are not able to pass the state-required algebra and English tests to receive a diploma even though they do not meet basic proficiency requirements.

"Statewide, approximately eight percent of students in 2011 received such diplomas. But in Indianapolis Public Schools, that percentage was a startling 26.7 percent — a percentage that has been increasing over the past few years" (Moxley, 2012). Without waiver diplomas, the graduation rate in Indianapolis Public Schools would be 47.3 percent - slightly below their 2009 overall graduation rate of 48.6 percent. The implications of this are far reaching. This means that in the last five years, in spite of all the time, discussion, and resources dedicated to education reform, nothing has changed. In fact, graduation rates have become worse and students are even

less proficient in basic writing, reading and mathematics skills. Also, minority students are falling further and further behind. Almost one third of black students received a waiver diploma. One in seven Indianapolis students who receive free or reduced-price school lunches (a common measurement of socioeconomic status) received waivers. Hispanic students also received waiver diplomas at a rate of one in seven. In contrast, just one in 20 white students received waivers to graduate from Indianapolis Public Schools (Moxley, 2012).

Different reforms and solutions have been suggested to remedy this education crisis. One of the most touted reforms is to give more money to poor minority schools. While it is true that there are often significant socioeconomic disparities between urban city schools and their suburban counterparts, research has shown that money has very little to do with student performance, teacher engagement, and overall school academic ranking. While Stanford economist Eric Hanushek and his colleagues were conducting one of their education studies comparing individual states in the global educational rankings, they found that the list of countries that spend the most on education has little in common with their educational ranking. This also stays true on state levels. For example, in 2008 New York spent $17,000 per student and still came in behind 15 other states and 30 other countries listed on Hanushek's educational ranking list (Ripley, 2010). While money can play a role in educational outcomes, it is clear that there are other factors that have a larger effect on student success.

On the district website, Indianapolis Public Schools lists its mission as being able to "prepare and empower all students for life." Indianapolis Public Schools' vision is to be "the flagship in innovative urban education, preparing all students to be successful in the global economy" (About Indianapolis Public Schools, 2013). While these are admirable goals, Indianapolis Public Schools have a long way to go to accomplish them. My first suggestion for

moving toward providing students an education with a global perspective is to adopt 21st century learning skills and initiatives.

In the publication *Digital Transformation: A Literacy Framework for ICT Literacy* (2007), the Educational Testing Service defines 21st century learning skills as the following:

* The ability to collect and/or retrieve information,
* The ability to organize and manage information,
* The ability to evaluate the quality, relevance, and usefulness of information,
* The ability to generate accurate information through the use of existing resources.

(Digital Transformation, 2012).

Accomplishing these goals can be challenging but Partnership for 21st Century Skills, (P21) is "a national organization that advocates for 21st century readiness for every student. P21 is a broad coalition made up of education nonprofits, foundations, and businesses working together to make 21st century education a reality for all students" (Partnership for 21st Century Skills, 2012). This organization is available to help administrators, teachers, staff, and students accomplish these goals so they are able to compete on a global level. Partnership for 21st Century Skills provides multiple methods and resources available to teachers so that they can integrate skills into their current classroom assignments. There are practical ways teachers can apply 21st century concepts within their classroom without significantly impacting current heavy workloads. Even small classroom changes that add 21st century skills can help students leave school more prepared for college and the job market.

One of the most efficient ways to implement these skills in the classroom setting is to teach the "four C's": critical thinking and problem solving, communication, collaboration, and creativity and innovation (Preparing 21st Century Students for a Global Society, 2012). These

skills not only work in subjects like math, science and English, but they prepare students for the job market. More and more jobs require a higher skillset and an ability to think critically. To keep American workers competitive, students need to excel at the four C's skills. Integrating these skills into the classroom setting is easier if they can be worked into an already established curriculum. Science, technology, engineering, and mathematics curricula, commonly referred to as STEM, provide a natural pathway for integrating the "four C's" into the classroom.

Over the past few decades, educational initiatives involving science, technology, engineering, and mathematics curricula have risen, and policies have been made to implement STEM in the classroom. This change has taken place because experts realize how far the United States has fallen globally. STEM schools have proven their effectiveness around the country, and many cities have seen their students' success rates increase when STEM practices are brought into the classroom.

In Maryland, Baltimore Public Schools are attempting to revolutionize the way urban education is perceived. The city has assembled a number of "choice schools" so every student has the option to attend the school of his or her choice. Sixteen of the schools within the district are STEM-focused schools, and more are slated to open in the coming years. Students at every STEM school are held to high academic standards. The success of STEM-focused schools is dependent upon several factors. Strong partnerships with universities and industries that work in science, technology, engineering, and mathematics are particularly essential to the success of STEM students (STEM-Focused Schools, 2012).

Andrés A. Alonso, CEO of Baltimore City Public Schools, had this to say about the STEM curriculum, **"**Ultimately, the 'real world,' hands-on aspect of STEM-focused schools resonates with many students because it underscores the connection between school work and

their future interests and careers. The increased engagement is evidenced in the schools' popularity: of the five high schools in most demand, four are STEM-focused" (STEM-Focused Schools, 2012)

As the United States monitors the success rates of Baltimore Public School's STEM programs, other STEM programs have already proven their value, especially among minority and disadvantaged students. The study *Science, Technology, Engineering, and Mathematics (STEM) Pathways: High School Science and Math Coursework and Postsecondary Degree Attainment* found that black and Hispanic students who take high level courses in high school are as likely as their white counterparts to pursue STEM degrees in post-secondary education. The more opportunities black and Hispanic students have to study STEM-based curriculum in high school, the more likely they are to pursue STEM-related careers in the future. This increases overall success rates and economic opportunities for minority students in the future (Borman, K., Et. Al., 2007).

One city that has seen considerable success in their use of STEM curriculum is Camden, New Jersey. Dr. Gloria Bonilla-Santiago is the founder of the LEAP University Academy Charter School in Camden. In spite of the many urban educational challenges they face, 100 percent of their senior students graduate and go on to college. In an article for *U.S. News*, Dr. Santiago wrote about her experience with STEM programs and why they should be replicated throughout the United States:

> *Here's a heads up to some of the most dangerous cities in America: Detroit, Memphis, Lubbock, Tallahassee. Despite your problems--too many low-income residents, too much crime--it is possible to help children in your communities break the cycle of poverty. And all it takes is convincing adults to care and believing that poor kids can take an interest*

in STEM (the acronym for Science, Technology, Engineering, and Math education). Let me explain. The LEAP Academy--a charter school I founded in dangerous and impoverished Camden, N.J.--began its own STEM curriculum last year. Why STEM? Because this is where we know the jobs of tomorrow are. And people in inner cities need opportunities… The supply of open jobs is exceeding the number of qualified professionals to fill them. Technology is already influencing every single career out there. A few fields--computer science, engineering, environmental science, and medicine--are already experiencing serious imbalances. Meanwhile, there is the issue of global competitiveness. America needs to keep pace if we hope to remain a leader in the global economy. Add it all together, and you have the formula for opportunity (Bonilla-Santiago, 2011).

Indianapolis Public Schools fall into the demographics Dr. Santiago speaks about. In 2011, 81.1 percent of students in Indianapolis Public Schools received free or reduced lunch (Profile for Indianapolis Public Schools (School District), 2012). In the district, 70.8 percent of students belong to a minority group and 11.8 percent of students are English language learners (Education Budget Project: Indianapolis Public Schools, 2012). STEM curricula have the possibility to help these students reach higher education goals and they have the potential to lift students out of poverty. STEM curricula offer students the chance to be able to compete globally. If Indianapolis could implement STEM curricula on a wide scale basis throughout city schools, they could become a model for the nation in education reform. Indianapolis students would be able to perform in a global economy, and they would alter the legacy of Indianapolis Public Schools.

Undertaking this task is no small feat. Indianapolis Public Schools are in need of a number of reforms. If Indianapolis were to commence implementing STEM education throughout the district they would need help and backing from the community. Universities, businesses and government support would all be required to see any positive change take place within the community. No matter what steps Indianapolis Public Schools take to become competitive, they need community support to implement changes.

One institution beginning to address the educational issues and lack of STEM curriculum in Indianapolis is Shepherd Community Center. In 2000 Shepherd Community Center started a school with 12 three-and four-year-olds because they saw an unmet need within the area of Indianapolis they were serving. There was a significant lack of early childhood educational opportunities. Today, Shepherd's school serves over 150 students in preschool through fourth grade. While their students are not yet in high school, Shepherd recognizes the importance of starting academic initiatives at an early age, especially with students that come from at-risk situations.

The school at Shepherd was formed because the community center staff saw the negative effects of the public schools in their area. At the time, only 33 percent of students who entered high school in the area of Indianapolis where Shepherd is located graduated. Shepherd's students struggle with many of the challenges that come from being in an urban setting. There is a higher rate of poverty among the students they serve - 38.6 percent compared to 20.8 percent in the rest of Marion County. Seventy-seven percent of students in Shepherd's school are minority students. Shepherd is committed to helping their students succeed so they may have a better future (Interview with Shepherd Program Director Eric Weidman, 2013).

Shepherd has chosen to use A Beka curriculum within their school. This curriculum has a strong emphasis on phonics to help ensure that their students learn to read and build a solid foundation for a successful academic career. The idea is that as students build a strong literacy base and as the school continues to expand, more technology can be introduced into the curriculum, and a higher focus will be placed on STEM education. Program Director Eric Weidman had this to say about STEM: "Currently, we are in the process of learning more about the STEM curriculum and how to properly integrate that into our programs. Our grants manager and our director of strategic initiatives have been attending workshops and seminars about how best this is integrated. We understand the demands of our world to keep up with technology, science, and math, and we want to help to better prepare them (students) for success as best we can" (Interview with Shepherd Program Director Eric Weidman, 2013).

Shepherd's educational approaches have proven their success. Over 90 percent of students who attended Shepherd for elementary school go on to graduate from high school and attend college, join the military, or receive professional job training. As Shepherd works hard to change the future for so many of Indianapolis's children, they will continue to seek out ways to provide them with the best opportunities. The school at Shepherd has made it clear that integrating STEM curriculum into their programs will be an integral part of their continued achievements (Interview with Shepherd Program Director Eric Weidman, 2013). Shepherd's model of success should be looked at to help improve Indianapolis Public Schools. Implementing STEM curriculum is a crucial step to creating students who are better prepared for the modern economy and job market. Most importantly, Shepherd's accomplishments can be attributed to the community involvement in their programs. As Indianapolis Public Schools continue to debate the best course of action for improvement, STEM curriculum should be a priority. However, no

reforms should take place without community involvement. This is the only way for any reforms to become successful. Indianapolis has a long way to go to improve public education. Shepherd Community Center can be looked at as a model for student success and an example for how to overcome educational challenges in an urban environment.

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Genetically Modified Organism (GMO) Labeling in the U.S.

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Abstract: *To label Genetically Modified Organisms (GMOs) or treat them equally with non-genetically modified foods without labeling is a contentious issue, not only in the United States, but around the world, and has been ever since these engineered foods were introduced in the late 20th century (Huffman, 2004). This article seeks to objectively look at the issues from those that want to label GMOs and from those that are against it; as well as offer suggestions for moving forward to satisfy parties on both sides of the issue.*

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To label Genetically Modified Organisms (GMO/GMOs) or treat them equally with non-genetically modified foods without labeling is a contentious issue, not only in the United States, but around the world, and has been ever since these engineered foods were introduced in the late 20th century (Huffman, 2004). There are vociferous voices from public consumers about separating and labeling GMOs for safety, consumer knowledge, and individual choice reasoning; with equally vocal opinions from the agricultural industry about the expensiveness and futility of labeling.

What are GMOs? Huffman (2004) defines this genetic modification as a "…complex process that involves [the] insertion of [a] gene, often from a different species, into a plant or animal." The biotechnology process is called genetic engineering or genetic modification; and the plants that result from this process are labeled as GMOs (genetically modified organisms), GM (genetically modified) foods, GM (genetically modified) crops, or genetically engineered foods. (Huffman, 2004)

As Huffman (2004) clarifies the U.S. history of genetically modified crops, these organisms were bred first by the U.S. Department of Agriculture and state agricultural experiment stations, which are research centers that conduct scientific investigations to improve food and agricultural issues to increase crop yields. Eventually the private sector began to market high-yield hybrid corn to farmers, and with the fear of not being able to feed a growing world population the "Green Revolution" was born.

In the 1960s, rice and wheat hybrids were developed to increase crop production, lower food prices, and combat this fear of not having enough food to feed our planet. These hybrid crops were marketed as a new era of human ingenuity and human endurance, known as the

"Green Revolution." (Huffman, 2004) This epoch is logically followed by even larger jumps in technology with the modification of genetic material in plants and animals, known as the "Gene Revolution," which occurred in the 1990s. (Huffman, 2004) In 1996, the first herbicide-resistant genetically modified crop (*Roundup Ready* soybean*)* in the U.S. was patented and introduced to the market by a private company, Monsanto, to offer insect resistant cotton; and herbicide tolerant cotton, soy beans, and corn. (Monsanto, 2013)

The groups that support labeling of GMOs are consumers that doubt the safety of GM technology, demand further testing of GMOs, and are overly suspicious of "Big Ag." Big Ag refers to the handful of powerful multinational companies that control the overwhelming majority of the agricultural industry. For example, six companies (Big 6) produce the majority of the pesticides and seeds sold in the world*:* Monsanto, Syngenta, Dow AgroSciences, DuPont, Bayer, and BASF. (Wallich, 2013) Additionally, many non-governmental organizations (NGOs) support labeling GMOs, such as Greenpeace and Friends of the Earth. (Huffman, 2004).

These supporters argue that labeling GMOs should be required because:

- Other foods, such as meat, processed foods, artificially flavored foods, milk, etc. require labels, so all other foods should follow the same standard. (Mother Earth News)
- Other countries in the European Union, Japan, Australia, and others have created laws labeling and tracking GM foods (Chemical Week, 2003) (Huffman, 2004) so there are models to follow.
- Labeling would create traceability to allow regulators to safeguard against future food safety issues. (Chemical Week, 2003)

- Consumers have a right to be informed about what they are eating. (Mother Earth News, 2013)
- Some consumers need to be able to identify certain ingredients and avoid them due to health problems or allergies.
- Some consumers want to identify ingredients in order to avoid eating animal products (e.g. animal DNA) for religious or ethical reasons.
- Rousu et al. (2003) have shown that consumers would be willing to pay a higher price for non-GM crops.

Many of the labeling supporters present additional arguments that are not related to labeling, per se, but focus on the negative impact of growing these types of crops, ingesting these types of foods, and having multinational oligopolistic corporations control our food supply. Supporters argue that:

- There is insufficient data proving that GMOs are safe to digest. GM foods have been linked to higher rates of cancer, liver and kidney damage, embryonic development damage (Mother Earth News, 2013), however according to Antoniou, Robinson, and Fagan (2012) “no long-term rigorous safety testing of GMOs is required and regulatory assessments are based on data provided by the company that is applying to commercialise the crop.”
- Over time, the GM crops created to be insect-resistant or herbicide-tolerant create “super bugs” that are immune to currently-used insecticides. These super bugs would cause a grave threat to our food supply and resources trying to control them.

- The gene insertion of genetic engineering is an imprecise and unpredictable process which can cause mutations in a plant's DNA. Also dangerous, is the fact that these mutations are irreversible (Antoniou, Robinson, Fagan, 2012).
- Insect resistant crops are "toxic to plant-feeding insects" (Huffman, 2004) but can also be harmful to humans and eliminate unintended insects and other wildlife that is essential to a balanced eco-system. One example is the direct or indirect effects (due to environmental factors or gene insertion process creating new toxins within the plant) that GMOs containing Bt have had on butterfly and bee populations, causing their worldwide decline.
- There is a conflict of interest in the groups that oppose labeling GMOs, and support treating these crops and food equally as non-GMO crops and food. These supporters include the Big 6, and other large corporations such as Kellogg's, Nestle, ConAgra Foods, Pepsico, Campbell's, Del Monte, Clorox, Bayer, Du Pont, and Coca-Cola. This conflict of interest creates consumer distrust.

Arguments that the anti-labeling groups present include:

- GM foods are equivalent to non-GM foods. Mother Earth News (2013) tells us that "in 1992, the U.S. Food and Drug Administration ruled…that GM foods were substantially equivalent to their non-GM counterparts."
- Labeling would be cost prohibitive, something that would either or both decrease seller profits and/or increase prices for consumers. Wilson, Janzen, and Dahl (2003) quantify the costs of segregating GM crops from non-GM crops, as well as preserving the identity of the crop through seed selection, separate storage, handling, and documentation in

Table 1, however there are also increased costs for testing, regulation monitoring, enforcement, and risk premiums.

Table 1. Study on Segregation and Identity Preservation of GM Grains (Wilson, Janzen, & Dahl, 2003)

Researcher	Methodology/scope of analysis	Estimated cost of segregation/IP
Askin (1988)	Econometric model of costs for primary elevators	Increase of 2 grades handled increased costs <0.5¢/bu
Jirik (1994)	Survey of elevator managers and processors	11-15¢/bu
Hurburgh, Neal, McVea, & Baumel (1994)	Cost accounting model for high-oil soybeans	3.7¢/bu
McPhee & Bourget (1995)	Econometric model of costs for terminal elevators	Increasing grades handled increases operating costs 2.6%
Hermann, Boland, & Heishman (1999)	Stochastic simulation model	1.9-6.5¢/bu
Maltsbarger & Kalaitzandonakes (2000)	Simulation model for high-oil corn	16-37¢/bu
Nelson et al. (1999)	Survey of grain handlers	6¢/bu (corn) 18¢/bu (soybeans)
Bullock, Desquilbet, & Nitsi (2000)	Cost accounting	30-40¢/bu (soybeans)
Dahl & Wilson (2002)	Survey	25-50¢/bu
Wilson & Dahl (2001)	Survey of elevator mgrs. for wheat	15¢/bu
USDA ERS (Lin, Chambers, & Harwood, 2000)	Cost accounting adjustments to survey results for specialty grain handlers	22¢/bu (corn) 54¢/bu (soybeans)
Smyth & Phillips (2001)	Analysis of GM IP system for canola in Canada, 1995-96	21-27¢/bu
Gosnell (2001)	Added transportation and segregation costs for dedicated GM elevators	15-42¢/bu (high throughput) 23-28¢/bu (wooden elevators)
Sparks Company (2000)		38-45¢/bu (non-GM canola) 63-72¢/bu (non-GM soybeans)

- Labeling would also hinder the efficiency and speed in bringing GMOs to the worldwide market to combat growing food demands. Senator Stabenow (D-Michigan), chair of the Agriculture Committee argues against GE labeling due to the interference that it would cause with the FDA's determination of what labeling is essential for consumers, as well as the obstruction of getting new GE technologies to the public. Senator Stabenow is quoted as saying (Paul, 2013):

> It's also important to note that around the world now we are seeing genetically modified crops that have the ability to resist crop diseases and improve nutritional content and survive drought conditions in many developing countries. . . We see wonderful work being done by foundations like the Gates Foundation and others, that are using new techniques to be able to feed hungry people.

- Mandatory labeling may cause a proliferation of frivolous lawsuits.
- GM labeling may cause consumers and retailers to see GM foods as dangerous, less desirable, to think negatively about them in general, and to avoid them. Mandatory GMO labeled products in Japan and the European Union have resulted in retailers choosing not to stock these products. (Carter & Gruere, 2003)

As with the labeling supporters, anti-labeling supports argue more on the validity of biotechnology and genetically engineered foods, in general.

- GM crops have increased yields over non-GMO plants. GM crops are needed to feed the world's growing population, especially in times of climate change which affects food production rates.
- Less insecticides and herbicides are used in GM crops since they contain natural substances that protect against insects or herbicides.
- GM foods can be engineered for nutrient density, foods that include more nutrients for fewer calories. This is a way to combat malnutrition and poor health. The Food and Agriculture Organization of the United Nations (2012) estimates that, in the 2010-2012 time frame, 14.9 percent of developing countries' populations were undernourished. Approximately 18 million of these undernourished citizens live in the developed world!

- This ability to engineer foods for various properties can also be used to create low fat (or other) foods to combat our country's obesity epidemic. Ogden & Carroll's (2010) statistics on obesity in the United States in Table 2 show trends starting in the 1960s through 2008. These trends showed that 34.2 percent of U.S. adults are overweight, 33.8 percent are obese, and 5.7 percent are extremely obese; and that each year a larger portion of our population is overweight and obese.

Table 2. Prevalence of overweight and obese U.S. adults ages 20+ (Ogden & Carroll, 2010)

Sample size and weight status	NHANES 1988-1994	NHANES 1999-2000	NHANES 2001-2002	NHANES 2003-2004	NHANES 2005-2006	NHANES 2007-2008
Sample (*n*)	16,679	4,117	4,413	4,431	4,356	5,555
Overweight (25 ≤ BMI < 30)	33.1	34.0	35.1	34.1	32.7	34.2
Obese (BMI ≥ 30)	22.9	30.5	30.6	32.2	34.3	33.8
Extremely obese (BMI ≥ 40)	2.9	4.7	5.1	4.8	5.9	5.7

NOTES: NHANES is National Health and Nutrition Examination Survey; BMI is body mass index. Age-adjusted by the direct method to the year 2000 U.S. Census Bureau estimates using the age groups 20-39, 40-59, and 60 years and over. Crude estimates (not age adjusted) for 2007-2008 are 34.4% overweight, 33.9% obese, and 5.7% extremely obese. Pregnant females were excluded from the analysis.

But who makes decisions regarding labeling, marketing, and food in the U.S.? Congress, the U.S. Food and Drug Administration (FDA), the U.S. Department of Agriculture (USDA), and the Environmental Protection Agency (EPA) are all involved in setting, approving, monitoring, and enforcing food labeling standards in our country.

The U.S. Congress is the legislative authority of the United States government. Together members of Congress enact federal regulations, such as the H. R. 3147 amendment to the Federal Food, Drug, and Cosmetic Act that was proposed by in 2013 to "strengthen requirements related to nutrient information on food labels, and for other purposes." (H.R. 3147, 2013)

The FDA is a government agency "responsible for protecting the public health by assuring the safety, efficacy and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation." (U.S. Food and Drug Administration, 2013) As noted on their website, the FDA is also in charge of "advancing the public health by helping to speed innovations that make medicines more effective, safer, and more affordable and by helping the public get the accurate, science-based information they need to use medicines and foods to maintain and improve their health." Lastly, the FDA safeguards the security of our food supply. (U.S. Food and Drug Administration, 2013)

The FDA creates standards for labeling, however food producers have relative freedom in how they go about providing customers with the required information. The FDA can request changes or removal of labels, but does not preapprove them. (U.S. Food and Drug Administration, 2013)

The FDA requires labeling of GE products if the food has a "significantly different nutritional property; if a new food includes an allergen that consumers would not expect to be present; or if a food contains a toxicant beyond acceptable limits," according to the *Guidance for Industry Voluntary Labeling Indicating Whether Foods Have or Have Not Been Developed Using Bioengineering Draft Guidance* from the FDA (2013). In January 2001, the FDA submitted guidance for voluntary labeling of bioengineered foods with these conditions. (U.S. Food and Drug Administration, 2013)

In 1862, the U.S. Department of Agriculture (USDA) was created to collect and disseminate agricultural information from the government to the citizens, an important mission at that time when half of the population lived on farms. (USDA, 2012)

The USDA sets federal policy through various acts, such as the Food Security Act (also known as the U.S. Farm Bill), regulates and monitors food safety inspections, and ensures that our food is safe, and correctly labeled and packaged. As you will read below, the USDA's Food Safety and Inspection Service recently approved a GMO-free label for meat and eggs proposed by the Non-GMO Project. The USDA approved of the non-profit's requirements to use the voluntary label, auditing process, and standards. (Cleveland, 2013)

The EPA is an autonomous regulatory body established to protect the health and environment of our citizens. One part of their purpose that is especially relevant to the GMO labeling issue includes ensuring that individuals, businesses, and governments all have access to "accurate information sufficient to effectively participate in managing human health and environmental risks." (U.S. Environmental Protection Agency, 2013)

After Congress creates a law that involves the environment, the EPA constructs regulations to implement that law, sets national standards, helps everyone understand the requirements, and enforces the regulations. (U.S. Environmental Protection Agency, 2013)

Currently, the United States Congress, FDA, USDA, EPA, and other governing bodies work together to create standards for labeling food, while the states can enact bills to define standards, monitor, and enforce them. Since federal law does not regulate labeling of GE foods, manufacturers and producers are not required to label them, although some companies have voluntarily done so. (Center for Food Safety, 2013) Below are just a few images of GMO-free labels that companies have voluntarily added to their products.

USDA approved label

Chipotle menu labels

Other non-GMO label for products without Non-GMO Project verification

Katherine Paul (2013) of the Organic Consumers Association tells us that "Federal Law, upheld for decades by federal court legal decisions, allows states to pass laws relating to food safety or food labels when the U.S. Food & Drug Administration (FDA) has no prior regulations or prohibitions in place. There is currently no federal law or FDA regulation on GMO labeling, except for a guidance statement on voluntary labeling, nor is there any federal prohibition on state GMO or other food safety labeling laws."

The national non-profit public interest and environmental advocacy organization, Center for Food Safety (2013) details the recent bills that have been introduced by twenty-one U.S. states requiring labeling or banning GM foods. Of these twenty-one states, six have already voted against labeling state laws, and only one has conditionally been upheld.

Three examples of state proposals supporting mandatory labeling are detailed below: California and Washington both lost close battles to require mandatory labeling, however Connecticut becomes the first state to pass similar laws, but with heavy caveats.

In 2012, California sought mandatory labeling through Proposition 37: The California Right to Know Genetically Engineered Food Act. Although 51.4 percent opposed the act and

only 48.6 percent supported it, it is interesting to see the amount of funds that pro- and anti-labeling supporters have dedicated to this ruling. $46 million was contributed to defeat the bill by food and biotechnology companies (Top 5 contributors: Monsanto, DuPont, Pepsi, BASF, Bayer); and $9.2 million was donated to support the bill by organic and natural food business (Top 5 contributors: Consumers Union, UFW, The Center for Food Safety, California Council of Churches, American Public Health Association). (Pollack, 2012)

In 2013, Washington sought mandatory labeling through Initiative 522. 54.8 percent opposed labeling and 45.2 percent were in favor of the bill. The top five contributors – Grocery Manufacturers Association, Monsanto, DuPont Pioneer, Dow AgroSciences and Bayer CropScience – spent $22 million to fight this initiative, claiming that it would increase food prices and negatively impact the perception of GE foods. Of this $22 million, *The Seattle Times* asserts that only $550 came from state residents opposing labeling. The pro-labeling supporters, funded mainly by Dr. Bronner's Magic Soaps, the Center for Food Safety, and state residents, contributed almost $7 million. (Doughton, 2013)

In 2013, Connecticut became the first U.S. state to pass a law requiring labeling of foods with GMOs (except alcohol, food from farmer's markets, and unpacked foods for immediate consumption), when HB.6519 and HB.6527 were approved to label GE foods and GM baby foods. However, David DesRoches from *Hersam Acorn Newspapers* (2013) advises us that GMO labeling will not become mandatory, until "four other northeastern states…pass similar labeling laws…one of those states…border[ing] Connecticut. The combined population of these states needs to be at least 20 million."

As evidenced above, the issue of requiring mandatory labeling of GMOs is a fairly new legislative process in the United States. Nevertheless, there is much older and widespread legislation and regulation outside of our borders. According to the Center for Food Safety (2013), there are currently 64 countries that have mandatory labeling of GE food products, and three of these have an official ban on GE food imports and cultivation.

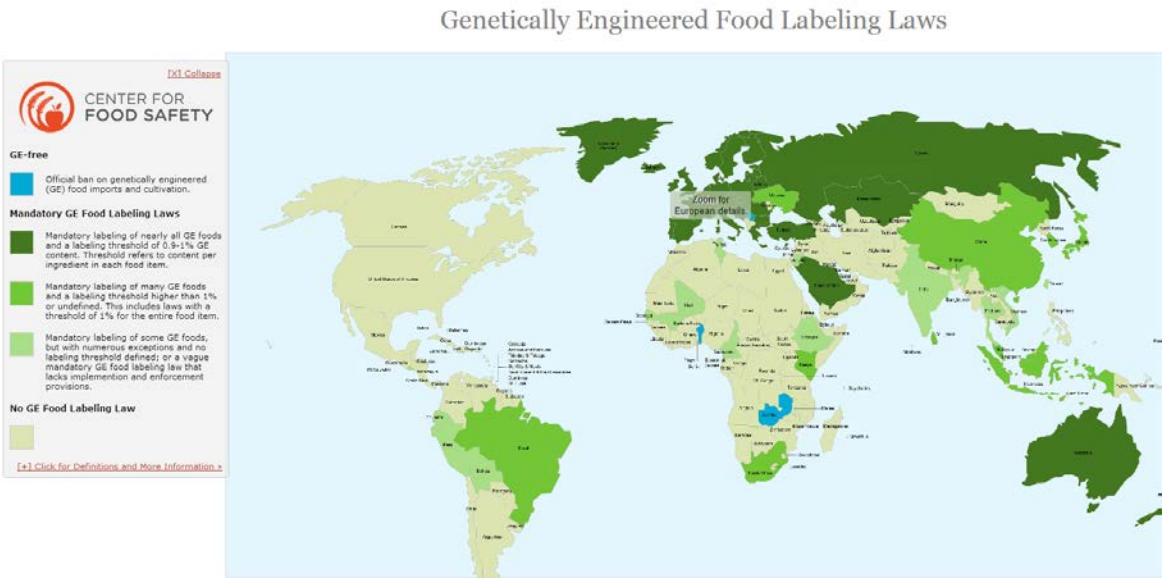
In 2006, India introduced GMO labeling legislation: *Rule 37 – E Labeling of Genetically Modified Food*, to require a label for processed foods, food ingredients, or additives from GM foods. (Gruere & Rao, 2007) Although this legislation was put into effect in 2013, there have been doubts about the lack of implementation and enforcement framework to accompany the GM label in the country. How will food be tested for GMOs? What is the threshold for minimum levels of GMO content? How will the law be enforced? (Huff, 2013)

In a Center for Strategic & International Studies (CSIS) Global Food Security Project report, authors Cooke & Downie (2010) give us Zambia's national policy on GMOs. Zambia is one of only three countries in the world that has an official ban on GE imports and cultivation, although recent government officials have shown more willingness to embrace GMOs in the future. (Center for Food Safety, 2013; Cooke & Downie, 2010) In 2002, the country's government decided to not accept GE foods, despite being amidst a food crisis, based on "scientific advice about long-term effects of the [GM products] and all related grains…" (Cooke & Downie, 2010) This stance has caused widespread mistrust of all GM foods in Zambia, as well as doubts about agricultural companies that push GMO technology and the U.S.'s continual pressuring to accept GMOs. Additionally, Zambia has built a National Biosafety Laboratory, managed by the National Institute for Science and Industrial Research that will eventually serve

to detect GMOs in seeds and grains, which will benefit citizens on a global scale if widespread GMO labeling becomes mandatory. (Cooke & Downie, 2010)

Table 3 shows us that countries in Africa, Asia, Australia, and South America all have some type of mandatory GE food labeling laws. Why is North America so different from the rest of the world?

Table 3. Worldwide GM Food Labeling Laws (Center for Food Safety, 2013).



Also found at: http://www.centerforfoodsafety.org/ge-map/

North and South America include the world's top four countries growing GMOs: United States, Argentina, Canada, and Brazil. Traxler (2006) tells us that these countries account for 94 percent of the GMO crop areas of maize, soybeans, canola, and cotton. Both the U.S. and Canada lead in the developing, testing, and acquiring regulatory approval of GMOs. The U.S. has received 68 approvals of 14 different crops; and Canada has received 48 approvals in 13 different crops. (Traxler, 2006) The presence and high stakes/investments of these private GE

production companies in these large developed countries of North America is most likely one significant reason for the absence of GMO labeling regulation here.

In my opinion, some form of mandatory labeling of GMOs will likely be required in the United States within ten years due to consumer preference and demand, the labeling legislation trajectory of countries with which we trade, and the inevitable need for regulation of new technologies. It also seems inevitable that the Big Ag companies that are spending inordinate amounts of money to fight labeling legislation cannot continue spending at this level indefinitely.

However, solely having legislation requiring GE/GM/GMO labels is not enough. As evidenced by the case of India and others' current labeling laws, education, threshold standards, monitoring, and enforcement also need to be part of the equation in order to yield a trustworthy and functioning process for GM and non-GM foods.

Looking at what has already been implemented abroad and proposed by U.S. companies wishing to voluntarily label non-GMO foods, there is a myriad array of possible solutions to accommodate consumer demand and assuage agricultural and biotechnology companies that have so much at stake in the labeling debate. Some of these include:

- Mandate a one to five year time period to review the effects of GMOs on humans, animals, other plants, and the environment paid for by GM agricultural and biotechnology companies; (If there is money for Big Ag to donate to pending laws, then there is money for them to conduct global studies on GMO effects.) and conducted by independent reviewers selected by USDA/FDA and approved by anti-GMO organizations, such as the Center for Food Safety. If there is no conclusion after such

time frame, then GMOs would be required to be labeled. This would provide an incentive to have extensive studies conducted by those opposed to them.

- In pending future legislation, limit financial donations on each side of the debate to allow for more leveled playing fields for pro- and against campaigns.
- Proliferate the idea of voluntary labels (as the USDA approved label has started the ball rolling), similar to the current organic and natural labels regulated by the USDA.
- Collaborate with government organizations in countries around the world to create global standards for GM or non-GMO labels.
- Bring both representatives from Big Ag or other companies against GMO labeling and centers and companies for GMO labeling together to create suggested national standards for mandatory GM product markers, indications, warnings, etc., as well as suggestions for monitoring and enforcement of these standards. These suggested standards could be brought to Congress, the USDA, FDA, and EPA for approval and adoption.
- Include federal government subsidies in the next U.S. Farm Bill to create infrastructure for separation of GMOs and non-GMOs.
- Introduce a bill at the federal level with standards on GMO labeling so that each state will work from overarching standards and not have to create their own. This will make interstate commerce easier, and allow for more efficiency in monitoring and enforcing laws when all states are working from the same standards.

The United States needs a strong federal stance to fashion a coherent front as we interact and trade with other nations, as well as to collaborate on further GMO research. Having each state customize their own regulations seems fragmented, inefficient, expensive, and more likely to fail.

In conclusion, through the vociferous and heavily-reported pro-GMO labeling supporters to the Big Ag oligopoly and other heavily-funded anti-GMO labeling supporters, we can see two opposing and polar opposite sides to this issue in our country. However, as with everything, there are more complex issues at play that will not allow us to make this a simple dichotomy of whether to label GMOs or not. Just because you are against additional labeling laws, does not mean you are against GM foods in general. Just because you do not think that our food decisions should be in the hands of a powerful agricultural oligopoly does not signify that you automatically back mandatory labeling of GMOs. Just because you like the idea of knowing where your foods comes from does not imply that you support labeling. Just because you agree that GMOs and non-GMO foods should not be lumped together does not necessarily suggest that you believe that the United States should generate separate facilities, transportation modes, and markets for both products. And just because you are a Republican politician does not mean that you support GMOs infiltrating the U.S. fields and market. (From the *Just Label It!* website (2012), we are told that 55 Republicans and Democrats from the U.S. House of Representatives and U.S. Senate signed a petition asking the FDA to endorse labeling of GE foods. The Center for Food Safety website (2013) tells us that one Republican Senator and one Republican Representative are co-sponsors of a federal bill: Genetically Engineered Food Right to Know Act.) Keith Kloor (2013) sums up the debate from his viewpoint when he says: “Personally, I’m ambivalent about GMO labeling. I see right through the naked cynicism of the Right to Know campaign. It is totally disingenuous. On the other hand, as any student of Aikido or Tai Chi knows, redirecting the force of your attacker is an effective tactic. There is a case to be made that a GMO label on foods would neutralize the opposition and eventually pave the way to greater acceptance of biotechnology.”

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Strengths and Weaknesses of Sustainable Land Use Policy in Greensburg, Kansas

Erin Mulryan

Abstract: *Sustainable development and planning have been the driving agents of European land use policies for many years, but the concept of sustainability has been slow to take hold in the United States until recent years. This article briefly explores the strengths and weaknesses of new sustainable land development regulations in Greensburg, Kansas, which was devastated by a tornado in 2007. Community leaders and residents worked collaboratively to establish new regulations to rebuild a "greener" Greensburg, and the community's accomplishments will hopefully serve as examples of sustainable land use policies for other cities and towns in the nation to follow.*

On May 4, 2007, Greensburg, Kansas was hit by a tornado that rated five on the Enhanced Fujita (EF) scale, a system developed by weather researchers to rate tornados based on wind speeds and physical damage. The tornado destroyed over 90 percent of structures in the small city that 1,389 residents called home. In the months following the tragedy, the city adopted the Greensburg Long-Term Community Recovery Plan, which was prepared through the Federal Emergency Management Agency's Long-Term Community Recovery program. The process for developing this plan involved steering committee meetings, stakeholder interviews, and discussions with citizens, civic groups, business owners, and local, state, and federal officials.

The final Long-Term Community Recovery Plan identified important projects for the city. One recommended project was to develop the Sustainable Comprehensive Plan, which was listed "with a high recovery value as it serves as a blueprint for the redevelopment in Greensburg" (Greensburg Sustainable Comprehensive Plan, 2008). The Sustainable Comprehensive Plan (2008) represented the visions of city officials and residents "to rebuild a prosperous future through sustainable community design." This plan was also recommended to be used as a guide by city administrators and the City Planning Commission to refine the city's zoning codes and ordinances.

The Greensburg Planning Commission, in keeping with the recommendations of the Sustainable Comprehensive Plan, adopted the Sustainable Land Development Code in March of 2011. Within the Land Development Code is the Sustainable Zoning Ordinance (SZO); the stated purpose of the SZO is "to establish zoning districts and regulations governing the sustainable development and use of land within the City of Greensburg" (Article 1, Section 1.1). Also within the Sustainable Land Development Code is the Sustainable Subdivision Regulations (SSR) code. Article 1, Section 1.3 of the SSR states that, "these regulations are intended to create

development patterns that will be sustainable over time." The SSR contains regulations such as the procedures for development approval, lot subdivision, design standards, development of conservation subdivisions, and administration of the SSR.

City officials and residents worked hard to capture goals and initiatives that meet their social, economic, and sustainability objectives. Review of the SZO and the SSR within the Sustainable Land Development Code found numerous strengths and few weaknesses. For the purposes of this article, I chose three strengths and three weaknesses of policies in the SZO and SSR to discuss.

Strengths

Provisions for horticulture activity, local produce cultivation, and local produce sales are promoted in Article 3 of the SZO. Accessory structures such as sheds and greenhouses are allowed only in the side and rear yards in residential districts, but "horticulture activity" is permitted as accessory use and is allowed to be located in any yard, including the front (Section 3.1 B, #8). In addition, Section 3.11 D permits the seasonal sale of locally grown farm produce, and allows for temporary structures in the front yard required by the ordinance for all residential lots for the duration of the sale. (Note: "horticultural activity" is not defined in Article 17, Definitions.)

Article 4 of the SZO "promotes the use of solar energy systems to reduce the on-site consumption of natural gas and/or utility power" (Section 4.1A). This article regulates the yard setbacks for all solar and wind energy systems and allows for solar systems to have the same lot line setback regulations as accessory structures such as sheds and greenhouses (lot line setbacks refer to the distance from the building structure to the property line). In addition, Article 2,

Section 2.2 A (5) allows for "passive solar energy systems" to project (overhang) into front yards up to ten feet and into side yards up to six feet, further promoting the installation of solar systems in all zoning districts. These regulations permit homeowners to install solar systems on their houses as well as in yards, promoting the generation of more renewable power.

Low Impact Design, storm water management, and erosion control are addressed in Article 6 of the SZO. Standard 3 of this article requires the use of bio-retention areas, rain gardens, dry wells, and the utilization of grass channels to filter pollutants before they leave the site. The intent, as stated in Section 6.1, is to "promote storm water management practices that maintain pre-development hydrology…and detain storm water close to its source" (6.1 A), and to "protect natural resources…from degradation that could be caused by construction activities and post-construction conditions" (6.1 B). The regulations in Article 6 represent one of the methods to reduce pollution from runoff as discussed by Campbell and Corley (2012, pg. 180).

Weaknesses

As stated, there are few weaknesses in Greensburg's SZO and SSR. One weakness is found in Article 7, Section 7.4 of the SZO, Sustainable Landscaping. This section neither promotes nor requires the use of native plants for landscaping. Furthermore, the use of native plants in storm water management is not specifically stated in Article 6 regulating Low Impact Development (discussed above). Gill (2000) asserts that "native plants possess certain traits that make them uniquely adapted to local conditions, providing a practical and ecologically valuable alternative for landscaping, conservation and restoration projects, and livestock forage." The sustainable landscaping requirements of Article 7 could be strengthened by requiring developments to utilize native plants for a specified percentage of the overall landscaping, and

by requiring the use of natives for the bio-retention areas and vegetation strips discussed in Article 6 for use in storm water management and runoff control.

As discussed previously, Article 3 of the SZO allows for horticulture activity and private local produce sales. Article 6 of the SSR, Conservation Subdivisions, lays out many regulations for lot sizes and the permitted uses, ownership, and management of the open spaces required by this article. (Note: 40 percent of a conservation subdivision must be open space.) Section 6.4 C (6) permits open spaces to be used for "agriculture, horticulture, silviculture or pasture uses, provided that all applicable best management practices are used to minimize environmental impacts." Brown and Jameton (2000), in their research of the Plant-People Council, found that "recreational gardening has been observed to be a way to relax and release stress." This article could be strengthened by specifying that a portion of the required open space or another space within the conservation subdivision be used for community agriculture, which would promote neighborhood cohesion and personal wellness by allowing for a community space where neighbors can interact with each other, relax, and enjoy recreational gardening.

Perhaps the biggest weakness of the Sustainable Land Development Code is the lack of clarity regarding when and where conservation subdivisions are to be built. The SZO, in Article 2, provides for the designation of zoning districts and states minimum lot sizes and yard setbacks for residential districts, but the lot sizes and yard setbacks for these residential districts are different from those in Section 6.2 C of Article 6 for conservation subdivisions. Also, the zoning map in the SZO does not show any areas that are specifically zoned as conservation subdivisions.

These points highlight that, although conservation subdivisions are regulated, there is no regulation that *requires* that all residential districts abide by the standards of conservation subdivisions nor does it require that specific natural areas be conserved. Although

"sustainability" is stated in one way or another as the goal of the Land Development Code in several places (in nearly every article in the SZO and the SSR, in fact), the code is weak in that it only provides for requirements for conservation subdivisions *if* a developer decides to abide by the requirements. A better way to ensure neighborhoods are built more sustainably and that natural areas are protected in perpetuity is to require *all* neighborhoods be built to the conservation subdivision regulations. The Planning Commission could also revise the code to require that some areas be conserved and make available a Transfer of Development Rights (TDR) program as discussed by Feiock, et al. (2008), in order to protect environmentally sensitive areas.

City officials and residents laid out several goals for rebuilding a "greener" Greensburg in the Sustainable Comprehensive Plan. The SZO and SSR contain many protections for reducing pollution, promoting alternative energy systems and horticultural activity, and the preservation of open space. These command and control land use policies were borne from stakeholder involvement, public outreach meetings, and recommendations of the Sustainable Comprehensive Plan, exemplary of sustainable policy development. Although these regulatory zoning tools, according to Campbell and Corley (2012), "focus on regulating behavior rather than providing for economic incentive for alternative behaviors," they still promote sustainable initiatives to reduce the city's impact on land, water, and air, and help to ensure that Greensburg rebuilds so that future generations will enjoy a cleaner, greener community.

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Increasing Indianapolis Residential Recycling Rates via Survey

Nekoma Burcham[4]

Abstract: *The City of Indianapolis worked with its waste removal company to run a free pilot program for curbside recycling. The city hoped that getting the bins out to residents' houses free of charge— getting them familiar with the program--would peak interest and eventually increase long-term paid program participation; this was not the case. According to the research, successful recycling programs are built on the specific needs of the community they serve. This paper proposes a survey to better understand Indianapolis residents and their feelings and apprehensions regarding curbside, residential recycling.*

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On November 3rd, 2012, the *Indianapolis Star* published an article reporting a dismal 10 percent participation rate in a city-wide residential curbside recycling program. As part of a pilot program to peak residents' interests in utilizing curbside recycling services, Republic Waste Services, the city's garbage collector, offered two separate ninety-day trials where participants could try curbside recycling without charge. Once the trial period was over, residents were charged a $6 monthly fee to continue receiving the service. Of the 14,200 customers who participated in the program, 52 percent continued after the free period. Retention rates of greater than half is promising on its face; however, it is important to look at these statistics in context. The increase in participation brought Indianapolis to its current rate of 10 percent of residents involved in the curbside recycling program. Participation rates in cities of comparable size and structure are above Indianapolis's; Milwaukee boasts an 85 percent rate, 65 percent of Des Moines residents participate, as do 35 percent of Louisville homes. While the $6 monthly cost may seem like a small amount, most believe this is the main stumbling block for involvement. Residents do not want to pay more to recycle, which makes it difficult for Indianapolis to achieve its goal of becoming the Midwest's most sustainable city (Jacobson, 2012).

According to the U.S. Environmental Protection Agency (EPA), a pay as you throw, or unit-based, program for waste removal is the best way to incentivize curbside recycling participation ("Recycling and other complementary programs", 2012). However, the cost of administering a pay as you throw system is often a deterrent for cities. A way to better estimate levels of involvement in the curbside program, should such incentives exist, may help to justify the heavy initial investment for a pay as you throw system.

This paper will present a scientific means by which to survey residents to better understand their recycling preferences and what type of incentives may be meaningful to them.

The data collected will help to better gauge residents' interest levels and inhibitions; Indianapolis can then better tailor a curbside-recycling program to its residents' needs.

Overview

In 2008, the newly elected mayor of Indianapolis, Greg Ballard, created the Office of Sustainability (SustainIndy) to serve as the catalyst and hub to push Indianapolis toward Mayor Ballard's goal of making Indianapolis "one of the most sustainable communities in the Midwest" ("Sustainability report to," 2012). In order to reach this goal, Indianapolis must do a better job diverting waste from the incinerator back into the production stream via recycling.

Indianapolis is an interesting case study because it has multiple factors that could potentially have an impact on the proposed recycling program. For starters, Covanta Energy has partnered with the city of Indianapolis to incinerate garbage to create the steam used to heat 40 percent of downtown Indianapolis ("Convanta energy facilities,"). Because of this symbiotic relationship, the city of Indianapolis is able to keep trash disposal costs down. This agreement is one major factor that has resulted in a resident's trash removal bill holding at $32 a year, with no increase in cost for the past 20 years (Jackson, 2012). These dramatically low rates help to lessen the impact of generating waste. It should also be noted that, according to research co-sponsored by Covanta, even if the whole of the U.S. could bring its recycling rates up to that of Europe, there would still be ample amounts of solid waste to be used for waste-to-energy incineration (Berenyi, 2009).

On top of the low cost of waste removal, the city-wide billing cycle poses additional issues. Currently, Indianapolis bills the cost of trash removal at a flat rate via a resident's annual property tax bill. This only helps to mask the actual cost of generating waste on a personal level.

Should a residence generate two or fifteen bags of trash a week the cost remains the same. Additionally, not having a physical bill each month, or even each quarter, reminding residents they are paying for the waste they generate only serves to further remove the sense of responsibility. This compounds the issue of sending a bill for the voluntary service of recycling because, even though the monthly cost may be relatively small, the reminder that it is a cost arrives monthly. Republic Waste Management conducted the free test pilot program with the goal of getting people familiar with the program and increasing enrollment in the standard residential curbside program. The hope was that if residents could experience the ease of use of the curbside program, residents might be willing to pay the small fee to continue using the program rather than using the drop-site option. Republic forwent revenue in the hopes of raising future revenue through increased participation; however, this plan did not work.

What are the actual barriers and perceptions of Indianapolis residents when it comes to recycling? If the Department of Public Works had a better understanding of what residents want in terms of a residential recycling program, enrollment could be higher. This paper proposes a plan that would address this information gap by developing a plan to collect measurable data regarding residents' feelings about curbside recycling.

The academic landscape

When it comes to measuring someone's likelihood to recycle, there are many factors to consider. There is already an ample amount of research to help explain the possible responses from survey respondents. The Theory of Planned Behavior (Ajzen, 1991) is a long standing, empirically tested, social theory. It provides a means to effectively measure a person's intent, should specific factors be accounted for, to take a specific action. For the purpose of this

research, the theory will be applied to Indianapolis residents' intent to participate in some version of an incentivized curbside recycling program. In order for Ajzen's theory to hold, the participants must believe they have control of their own actions. For this reason, this theory would only be applicable should a voluntary program be implemented.

Convenience of participation has also been determined to be a major factor in participation rates (Perrin & Barton, 2001). Considering the mechanisms are already in place for curbside pick-up, convenience should not be a big concern. The Perrin & Barton study also reveals that the lack of recyclable materials also affects a household's ability to participate in the program. Republic Waste Management's intake facilities allow for a wide range of acceptable materials, so this does not appear to be a major barrier in Indianapolis's program. With this said, there will likely be a perceived lack of materials rather than an actual lack of materials. Much research has been done to show that, with proper education of what is acceptable, and how to identify appropriate materials, this can be overcome (Oskamp et al., 1998; Shrum et al., 1994). A study conducted using data gathered primarily within the United Kingdom found that indoor space required, or overall inconvenience for sorting and storing materials, was also identified as a barrier to recycling (Jesson & Stone, 2009).

Martin et al. (2006) conducted research identifying many concerns that can be addressed when constructing a curbside program. For example, the researchers found that participation rates were higher when the recycling schedules coincided with the standard trash removal pick-up dates and times. Their review of published research also resulted in their conclusion that there is no ideal structure for a residential recycling program, but that the program needs to be tailored to the identified needs of the community. It is the hopes of the researcher that the proposed survey will help to provide this information for consideration.

Currently, the understanding within the waste management industry is that unit-based pricing for waste removal is a strong incentive to build recycling involvement (Kipperberg, 2007). Unit based pricing, or pay as you throw, is the practice of billing residents based on how much garbage is thrown away, rather than a flat rate disposal fee. Some communities bill by the trash bag, by the waste bin or, most infrequently by the total weight of garbage. In an effort to keep down waste removal costs, many homes will increase their recycling and composting rates to decrease the amount of garbage generated. Kinnaman & Fullerton (1997) conducted a comprehensive study of communities with and without unit-based pricing for trash removal. Their research found and increase in recycling program participation in the areas with unit-based pricing trash removal.

The Plan

Will Indianapolis residents willingly participate in curbside recycling programs? If so, what specific structures should be in place to result in the highest participation rates possible? It is not until a survey of residents is conducted that the answers can be known. Without survey results, the risks of creating another failing curbside recycling program is likely. To be good stewards of taxpayer dollars, it is imperative to insure funds are spent right the first time. By conducting this survey, it is more likely the city will design a more desirable recycling program that could lead to increased participation, which could aid Indianapolis in achieving its goal of becoming the greenest city in the Midwest.

The unit of observation is Indianapolis households, and the unit of analysis is individuals living within those households. For the purposes of this study, the term household refers to any single unit billed for recycling or trash removal. For example, a single individual may own a

home but share the home with two roommates; this is a household just as a single-family unit living in a home would be. It is important to acknowledge the impact of rental units on this study; any curbside recycling program that incentivizes recycling must identify the individual units, or households participating. Multiple households may reside within an apartment complex, and apartment complexes may also provide a single refuse point for multiple units, thereby limiting the ability to identify the individual households' units of waste. Because of this, the focus will be on all residential units not coded as rental properties for tax purposes.

For this study, all surveys will be addressed to the "heads of the household." A family unit's likelihood to recycle is often based on the head of the household's willingness to participate. The intent is to mail a self-administered survey with the monthly trash collection bill. This assumes that each residence paying a bill for trash refuse would be subject to the curbside recycling program; however, because Indianapolis includes the cost of trash removal in the annual property tax bill, this will not be a timely means by which to contact the identified population. In lieu of inclusion in monthly bills, a list of property tax bills including the names and addresses of residents will be used as the sample frame from which survey recipients will be pulled.

According to Stats Indiana (2011), there are 474,286 owner occupied housing units in Indianapolis as of 2010.

Housing	Number	Rank of 12	Pct Dist. In Region	Pct Dist. In State
Total Housing Units in 2010 (estimate)	793,518	1	100.0%	100.0%
Total Housing Units in 2010 (includes vacant units)	793,518	1	100.0%	100.0%
Owner Occupied (Pct. distribution based on all housing units)	474,286	1	59.8%	62.5%
Renter Occupied (Pct. distribution based on all housing units)	238,782	1	30.1%	27.0%

Source: U.S. Census Bureau, American Community Survey 2005-2009 5-year estimates.

Using this total population, a confidence level of 95 percent, and a confidence interval of two percent, a sample size of no less than 2,389 Indianapolis households should be selected to receive the self-administered survey.

Cost has been frequently identified as a reason for not participating in the curbside program (Blaine, Lichtkoppler, Jones & Zondag, 2005). Housing value is a good indicator of family income and will be used as the basis to structure the stratified multistage cluster sample of those to be surveyed:

1. The addresses will be clustered by home value. A list will then be made of residents within each cluster.
2. A random list of addresses will be generated.
3. A self-administered mailer will be sent to the random-address list.

Indianapolis home values are not categorized into equal-sized groups, as is shown in *Table 1*. For this reason, the Probability Proportionate to Size model should be used to insure the sample set is as representative of the population as possible. The selection of households within each cluster will be proportionate to the percent of the cluster to the whole of the group. The resulting sample will be representative of the housing value breakdown of the city. Additionally, the level of error can be estimated within the sample via probability theory by using this means of sampling.

Value of Home	**Percent of Whole**	**Sample Size Needed**
Less than $50k	7.14 percent	171
$50k to $99k	26.93 percent	643
$100k to $149k	33.44 percent	799
$150k to $199k	15.85 percent	379

$200k to $299k	9.47 percent	226
$300k to $499k	4.71 percent	113
$500k to $999k	1.91 percent	46
$1MIL plus	0.54 percent	13
TOTALS	**99.99 percent**	**2390**

The survey will be constructed using the semantic differential format. A very brief description, or narrative, will be given to describe the specific types of incentive-based recycling programs: pay as you throw bin program, pay as you throw bag program, and recycle rewards or recyclebank. After each brief narrative, a short semantic differential questionnaire will follow. The resulting ordinal responses will be used to construct a composite measure of interest of Indianapolis owner-occupied households in various curbside recycling programs. Chu & Chiu (2006) conducted a survey based on Azjen's Theory of Planned Behavior; the basic constructs of their questionnaire helps to identify and measure the three factors that lead to predictive behavior: personal attitude, social norms and perceived behavioral control (Azjen, 1991).

Conclusion

Residential recycling programs are not an easy endeavor for municipalities to take on. Via its website, the EPA posts applicable research and resources for reference to help communities across the U.S. develop and maintain cost-effective residential recycling programs; however, as Martin et al uncovered, the only consistent answer to how a program should be designed is based on the community's needs. A well-structured survey, disseminated as proposed above, will likely provide the data necessary to develop a successful residential recycling program for the city of Indianapolis.

Custom Profile

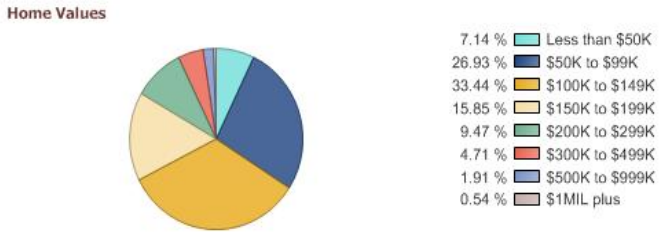
Households in 2010

	Number	Pct. Dist
Total Households	366,176	100.0%
Family Households	218,338	59.6%
Married with Children	56,067	15.3%
Married without Children	79,152	21.6%
Single Parents	48,251	13.2%
Other	34,868	9.5%
Non-family Households	147,838	40.4%
Living Alone	117,050	32.0%
Average Household Size	2.47	
Average Family Household Size	4.14	

Source: **US Census Bureau, American Community Survey 5 Year Estimates**

Home Values in 2010

	Number	Pct. Dist
Owner Occupied Units	210,098	100.0%
Less than $50,000	14,994	7.1%
$50,000 to $99,999	56,582	26.9%
$100,000 to $149,999	70,266	33.4%
$150,000 to $199,999	33,304	15.9%
$200,000 to $299,999	19,898	9.5%
$300,000 to $499,999	9,904	4.7%
$500,000 to $999,999	4,023	1.9%
$1,000,000 or more	1,127	0.5%
Median Value ($)	122,200	



Source: US Census Bureau, American Community Survey

Note: Home sales data for counties other than Boone, Brown, Decatur, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Montgomery, Morgan, Putnam, Shelby may be incomplete.

(Metropolitan Indianapolis board of realtors, 2011)

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Trash Turned Resource: Bush Stadium Seat Salvage Project

Amy Crook[5]

Abstract: *People for Urban Progress (PUP), an Indianapolis-based 501(c)3 promotes and advances public transit, environmental awareness and urban design. They take on massive salvage projects including accumulating materials that has a symbolic connection to Indianapolis.*

[5] Amy Crook joined People for Urban Progress (PUP) as Development Innovator in February 2012. She is a marketing professional proud to call downtown Indianapolis home. Her past work includes franchise development for a food concept covering the Midwest region and business development for a brewery expanding into Wisconsin and Kentucky markets. Amy also serves on the Indianapolis Downtown Marketing, Inc Board, she is on the Resource Committee for the Indianapolis Cultural Trail and the Young Alumni Council for Kelley School of Business at Indianapolis.

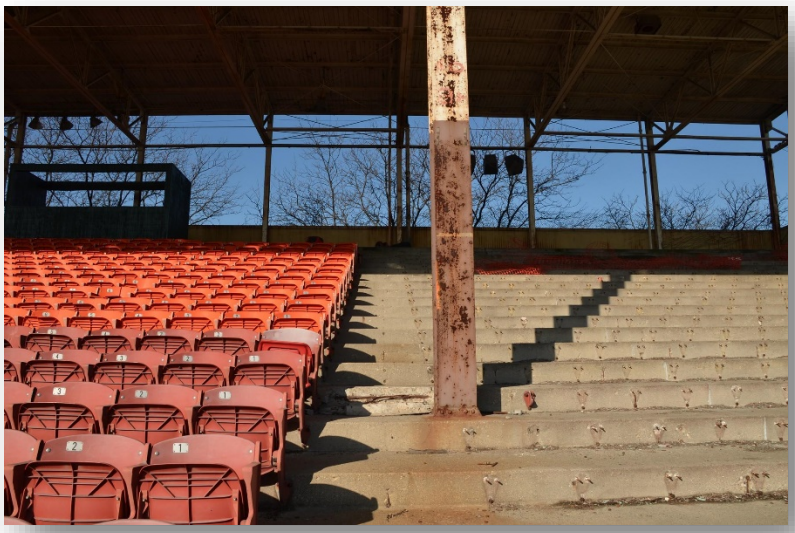
People for Urban Progress (PUP), an Indianapolis-based 501(c)3 promotes and advances public transit, environmental awareness and urban design. They take on massive salvage projects including accumulating materials that has a symbolic connection to Indianapolis. The organization is turning what once may have been viewed as trash headed to a landfill into a resource that is given a second life in the community. To date, the organization has salvaged 13 acres of the RCA Dome roof top (the Dome that formerly hosted the Indianapolis Colts team prior to current, Lucas Oil Stadium), five miles of Indianapolis-hosted Super Bowl 46 banners and 9,000 Bush Stadium Seats (former home of the Indianapolis Indians AA baseball team prior to their current home, Victory Field). The organization makes products with the RCA Dome fabric as the base material including wallets, clutches and messenger bags to raise money to fund the design and installation of public shade structures using this same material at pocket parks and urban farms. The Bush Stadium Seat Salvage and PUPstop program is a great example of their social enterprise at work. PUP salvaged 9,000 seats and sold 1,000 seats, as-is, to the general public to raise money to support public installations. PUP's main program for public distribution of this cherished resource is installing the seats at IndyGo, Indianapolis Public Transportation bus stops addressing a specific need. Not including stops with overhead shelters to protect you from the weather elements, only 42 of 4,000 stops had any seating amenity. PUP aims to double that number by the end of 2013. The project has been featured in this year's SpontaneousInterventions: urban actions for the common good exhibit as a part of the Venice Architecture Biennale. The exhibit is in the Chicago Cultural Center through September 1, 2013.

People for Urban Progress (PUP) is an Indianapolis-based 501(c)3 not for profit established in 2008. The organization formed around their first project, salvaging 13 acres of the rooftop of the RCA Dome, the Indianapolis sports stadium that was the home of the Indianapolis Colts. The organization began making products out of this teflon-coated fiberglass including wallets, clutches and messenger bags to name a few. The money raised from the sale of these products funds projects that the organization takes on that fall within their mission of promoting and advancing public transit, environmental awareness and urban design.

To date, PUP has sold 4,000 products made out of this RCA Dome roof top material. The proceeds from the sale of these goods has paid for the design and installation of three shade structures: 1) Reagan Park (located near 25th Street and College Avenue) 2) Highland Vicinity Park (located at 29th Street and Capitol Avenue) 3) South Circle Farm (located on South Meridian Street, 2 miles south of Monument Circle).

PUP also became stewards of 5 miles of banners from Indianapolis hosted Super Bowl 46. To date they are about 1 mile into fulfillment of reuse opportunities. They have incorporated these vinyls and mesh fabrics into their product line. In addition, they have repurposed the material for a public project, using a polyester fabric as fence covering at the Indy Bike Polo Court in Arsenal Park (located on 46th Street just east of College Avenue).

In October 2011, representatives of Ecolaborative presented the idea of salvaging Bush Stadium Seats to People for Urban Progress (PUP) knowing of their expertise for massive salvage projects like the RCA Dome roof top salvage. This was another salvage attempt with a short deadline as the stadium was currently owned and maintained by the Indy Parks Department and was getting ready to be sold to a developer planning to build Stadium Lofts as a part of the 16 Tech development, which is working to create a life sciences and information technology hub in Indianapolis.



The stadium held 11,000 seats. At the time, PUP had an urban planning intern, Ryan Gallagher, who was in the middle of a thesis project involving IndyGo, Indianapolis' public transportation system. He had realized the immense need for more seating amenities at IndyGo bus stops. What if we installed these Bush Stadium Seats at IndyGo bus stops? PUP presented the idea to IndyGo and they were ecstatic. They then began to prototype a set of 4 seats with the expertise of Indianapolis Fabrications. At the same time started to do some fundraising to pay for the salvage process. They were successful in raising $10,000, $2,500 each from Wishard Health Services, The Lumina Foundation, Central Indiana Community Foundation (CICF) and a private contributor.

PUP used the funds to pay for labor to remove the seats hiring RecycleForce. RecycleForce is a social enterprise, and not for profit, offering some of the most comprehensive and innovative recycling services while providing life-changing workforce training to formerly incarcerated individuals. The newly formed team had 13 days to pull out as many seats as they could. They managed to rescue 9,000 of 11,000 seats.

There were other expenses involved with the project. Transporting the seats to storage and the storage expense as a whole. In addition to the $10,000 fundraised. People for Urban Progress put in $13,190 towards the salvage project. This is money raised solely from the sale of products. This would equate to the profit from the sale of: 842 DOMEwallets, 987 DOMEclutches or 453 DOMEmessenger bags.

PUPstop Program

People for Urban Progress worked with IndyGo in the prototyping phase to refurbish a bench that would work at IndyGo sites. Indianapolis Fabrications completely refurbished the seat. The arms were painted with lead paint, so they had to be sent out to have professionally sandblasted. The arms returned and were then repainted. The seats were taken completely apart

to review that the pieces were not broken and could be reused. A ball inside the seat that helps with the flipping of the seat up and down was replaced and then all of the parts were put back together and attached to a custom made and built steel base with footings. The refurbishing cost came to $1700 for a set of four seats. PUP worked with IndyGo to roll out the PUPstop program. Basically, IndyGo has a budget for seating amenities. They applied that to the cost of the refurbished Bush Stadium seats and PUP seeks $850 in sponsorships to cover the rest of the cost per PUPstop installation.

Then, PUP tried something a little different. They had some public interest about the seats, so they thought they'd open their warehouse doors for a weekend to make the Bush Stadium Seats, as-is with no base, available for purchase to the public. They sold 962 seats. The money raised from the sale of these seats went to the labor of processing this material, taking the seats apart, using the forklift to reorganize our massive piles of material and to start organizing seat parts and overall storage expense. The additional money will go towards 10 more People for Urban Progress sponsored PUPstop installations. The community interest was astounding. PUP realized that the Indianapolis community is full of "Makers" and "Doers" interested and willing to assemble and create their own seating installations whether for public use or private, in using in their backyard.

Current PUPstop locations include:

1.) Alabama & Vermont Cultural Trail. Serving Routes 17, 2 and 5

2.) 86th and The Monon. Routes 18, 86

3.) 62nd and Carollton, Broad Ripple, Route 17

4.) Meridian and 26th, Ivy Tech, Routes 18, 38, 39

5.) Shelby Street at Garfield Park, Garfield Library, Route 22

6.) Staughton and Arlington, Devington, Routes 3, 4

7.) Central and 34th, Mapleton Fall Creek, Route 4

8.) Meridian and McCarty, Stadium Village, Route 16

The team of people behind People for Urban Progress is reinventing how we look at materials that have the potential for new life versus being thrown away in massive demolition projects. It is even more rewarding to be able to keep these resources in the community for the public to continue to use and enjoy. The projects PUP takes on must fall within two of three areas of focus related to transit, environment and urban design.