

SUMMER 2019

MOREHEAD-CAIN MEMPHIS FINAL REPORT

SUSTAINABILITY AND THE CIRCULAR ECONOMY

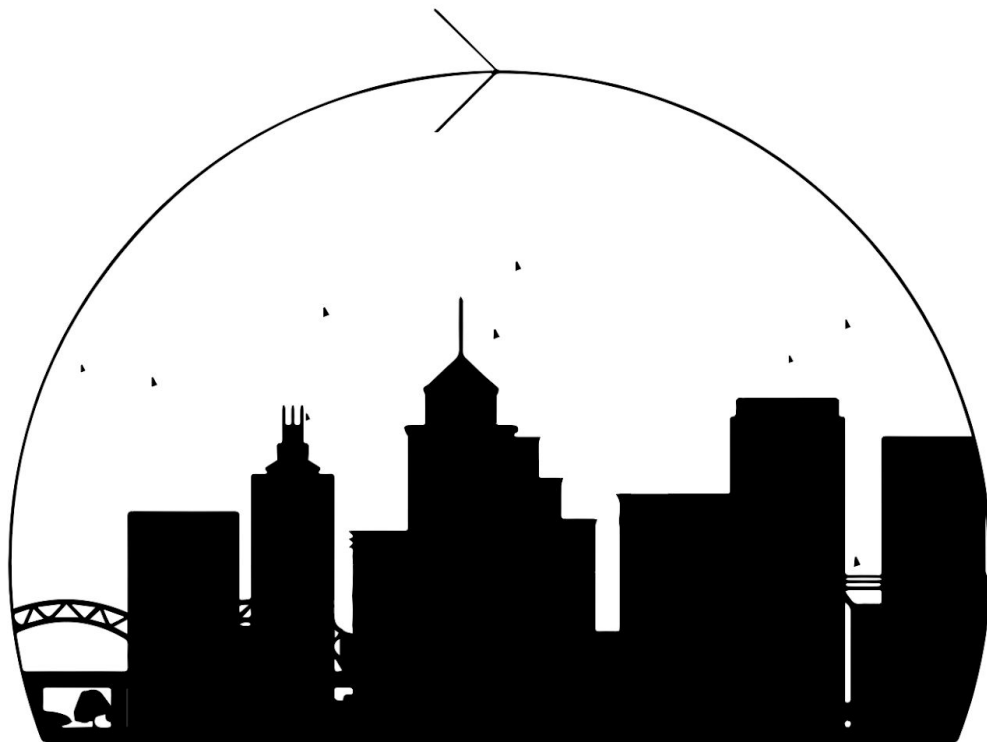


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Introduction

This summer, our team of four Morehead-Cain scholars from the University of North Carolina at Chapel Hill spent eight weeks in Memphis, Tennessee, working on a Civic Collaboration project in partnership with Innovate Memphis and the Hyde Family Foundation. The Morehead-Cain scholarship program is the first merit scholarship at the nation's first public university. The scholarship includes four Summer Enrichment Programs (SEPs). The second SEP, Civic Collaboration, allows a group of scholars to immerse themselves in a mid-sized city and attempt to fully understand one issue the city faces. Throughout the summer, the scholars are challenged to find real solutions for those issues, while working alongside Morehead-Cain alumni and host organizations selected by the Morehead-Cain foundation staff.

Our team was placed in Memphis and tasked with researching and addressing issues in the field of solid waste management — specifically recycling and the circular economy. With this project in mind, we began conducting research before coming to Memphis to get better understand the problem we would be exploring. Before we even reached Tennessee, we learned of the crisis facing businesses in the recycling industry and the importance of implementing a circular economy. The concept of a circular economy is centered around redefining waste as an asset. By redirecting waste products away from landfills and giving them a second life as an input for the production of another commodity, cities and regions are able to save money and better protect their natural resources. Often, this method also stimulates the green economy by creating jobs in the fields of recycling, processing, and manufacturing. Heading into the Civic Collaboration summer, our team kept the potential for a circular economy in mind as we continued our research.

Research: the Process and Insights

The starting point for the team's research centered around the issue of solid waste management in Memphis. In early 2018, in a response to high rates of contamination, China stopped accepting recyclables from the United States — forcing markets across the country to adapt. Without a buyer for these materials, U.S. cities have struggled to afford the costs of recycling, making recycling economically impractical in most cases.

Memphis is no exception to these conditions. All of the challenges the city was experiencing prior to 2018 worsened after China's decision. Once Memphis' end-buyer for waste disappeared, existing obstacles due to poor waste management infrastructure were further exacerbated. To name a few, the city has only one Materials Recycling Facility (MRF) that lacks in efficiency, no commercial recycling, a curbside collection program only a few years old, a tire crisis only worsened by the collection monopoly of Liberty Tires, and a general disinvestment to solve these problems.

As our team became aware of these overarching issues, we investigated each further to identify the full scope of what Memphis is facing. Overall, this research pointed towards a list of problem areas in the city to consider going forward.

Some of these include:

- Inefficient collection and reuse of tires
- Inefficient processing and reuse of glass
- Inefficient collection and processing of yard debris
- Inefficient collection and processing of plastics
- Lack of markets for construction debris reuse
- Lack of industrial composting and community participation
- Inefficiency and private ownership of MRF
- Contamination in MRF

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- General poor education around sustainable practices
 - Rising tipping fees
 - Inadequate job creation, economic inclusion, and growth through sustainable programs
 - Lack of commercial recycling collection
 - Insufficient corporate sustainability efforts
 - Lack of coordination and communication among all relevant parties
 - Political deadlock
 - General infrastructure and efficiency issues
 - Lack of public and private capital investment
 - Lack of a market for recycled materials

Considering these potential focus areas, our team turned to field research to assemble more qualitative research based on Memphis' history and the anecdotes and perspectives of local individuals. By interviewing the contacts provided by the Hyde Family Foundation and Innovate Memphis, our team gathered a variety of insights about Memphis' state of sustainability.

The list of organizations is as follows:

- Innovate Memphis
- Memphis/Shelby County Office of Sustainability
- Hyde Family Foundation
- AutoZone
- Tennessee Department of Conservation (TDEC)
- Department of Solid Waste

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- University of Memphis
 - Neighborhood Preservation Inc. (NPI)
 - Refurban
 - Closed Loop Partners
 - Le Bonheur Hospital
 - Edible Memphis
 - Downtown Memphis Commission
 - Memphis Chamber of Commerce
 - Clean Memphis
 - GetGreen
 - The Compost Fairy
 - Office of Shelby County Mayor Lee Harris

Each organization offered us knowledge from distinct areas of expertise and displayed varying levels of interest in helping Memphis implement more local circular economies. Some of the key takeaways from these meetings included perspectives on past and present initiatives, structural obstacles, and hopes for the future.

Listed below are some of these insights:

- A pilot for Bloomberg Philanthropy’s non-profit innovation model, **Innovate Memphis** is one of the more forward-thinking organizations operating around civic solutions in Memphis. They provided our team with an essential non-profit perspective, connections to relevant organizations, and knowledge on how to best engage a city that has fallen behind others. Innovate Memphis is interested in any project that moves the city forward — whether sustainability focused or not. For future efforts, this non-profit can provide realistic advice, expertise on city matters, and potential staffing needed to carry an idea forward.

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- The joint **Office of Sustainability** for Shelby County and the City of Memphis introduces many more opportunities for ambitious change in the region. Since its creation, the office has worked with several private and public partners to shape a comprehensive Climate Action Plan. Intended to provide the community with a framework for reducing greenhouse gas emissions with regards to energy, transportation, and waste, the plan is certainly a step in the right direction. With ambitious goals such as reducing greenhouse gas emissions below 2016 levels by 15% by 2020, more work is needed to transform the plan into tangible results and action. Our team worked closely with the office and discussed strategies to implement the Climate Action Plan. Most of this work centered around finding partners for the plan whose existing or potential efforts would move it forward. Due to the lack of staffing in the Office of Sustainability, finding partners and external support is crucial to the plan's success in the region. This work is ongoing, and our team is eager to see the benefits that this will hold for the future.

Along with the Climate Action Plan, the office intends to coordinate a waste characterization study or audit for the region. We believe this should be a high priority for Shelby County for several reasons. First, the Office of Sustainability admitted the waste section of the Climate Action Plan has the most room for improvement — likely due to a lack of metrics available in this area. Therefore, conducting a waste audit will provide the plan (and other organizations in the county) with crucial quantitative information like costs and total quantities of various solid waste streams. This valuable data will ultimately inspire heightened focus, increased funding, and streamlined work around waste efforts.

Looking to the future, the office would benefit from solidifying relationships with private partners, increasing staffing, and strengthening communication with other public offices. Similarly, the Climate Action Plan could benefit from improved marketing efforts and more actionable goals. The office is well aware of these potential next steps and continues to push forward as an ambitious vessel for change in the region.

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- **The Hyde Family Foundation** was instrumental in helping our team understand Memphis' complex history, providing advice on navigating progress, and offering key contacts to further the research process. The Foundation is a great example of an organization in the city whose mission is comprehensive and leaves room for a variety of projects. Although the Foundation's impact areas (High-Quality Education, Vibrant Spaces and Communities, Thriving Arts and Culture, and Engaged Leadership and Civic Pride) do not directly include sustainability, the Foundation can serve as a great resource for connections or funding if sustainability-focused entities can show how their programs have a broad impact and fit within their impact areas.
 - **AutoZone** is one of the largest private corporations in Shelby County and brings thousands of jobs to the area. Because AutoZone is in a "dirty industry," reliant on fossil fuels and fuel-inefficient vehicles, most of its sustainability efforts are focused around energy efficiency, recycling at its downtown Memphis headquarters, and ensuring positive investor relations through marketing its environmentally friendly policies. However, with only a handful of employees working in sustainability, AutoZone still has a lot of potential for growth when it comes to its corporate mindset and general buy-in. Potential for growth also lies in the relationship between Autozone and the public sector. Prior to meeting with our team, AutoZone was unaware of the Office of Sustainability's Climate Action Plan. The company and the Office of Sustainability both agreed they could have benefited from each other's insights during the creation of the plan. Overall, whether it's communicating its cost-efficient energy practices or offering their resources towards mutually beneficial programs, AutoZone has a lot to offer green initiatives and should be sought after for future initiatives.
 - **Tennessee Department of Environment and Conservation (TDEC)** plays a large role in state and county sustainability efforts through policy implementation and grant allocation. The department offers 13 different materials management grants, three recreation and green spaces grants, and a variety of other green initiatives that are an asset to both private and public applicants. One problem area TDEC specifically acknowledged was the difficulty in bringing people together around sustainability. Our team met with a local TDEC representative who had served on

Mayor Lutrell's now nonexistent Sustainability Advisory Committee in 2011. He noted the need to bring people together in a platform similar to the former mayor's committee — only if formed correctly. Because of the extensive impact of TDEC's policies and regulations, green NGOs and private corporations should increase dialogue and partnership with the department to help shape policies specialized to Shelby County.

- **The Memphis Department of Solid Waste Management** was able to provide our team with a realistic perspective on the city's waste system. With 20-25% of the city below the poverty line, the department is a low priority for the city, and unlike our team, the department rarely has the luxury to view waste as an asset and opportunity for innovation. Instead, the department must often act to prevent waste from being a political pressure point for the Mayor by ensuring citizens' waste is collected and handled in a timely and quiet manner. Considering this perspective, the department prefers to contract waste management out to private companies with the belief they are more efficient than the city. The two most controversial private waste companies in the area are Republic Services and Liberty Tires. While these companies offer the city large economies of scale, the Department of Solid Waste acknowledges there is room for improved collaboration. Because Republic is the sole owner of the city's landfills and the materials in its Material Recovery Facility (MRF), the city is often strongarmed by the interests of the company. Similarly, Liberty Tires is a consistent point of frustration. Technically considered a transfer station for tires, Liberty usually only takes 100 tires from the city per week. As the only company for tire recycling in the city, Liberty has the upper hand in the relationship and can take money from the city when they find it convenient. Overall, this situation is nuanced with a variety of interests. Whether the solution is public ownership and more investment, attracting competition for these private companies, or increasing regulations to negotiate stronger relationships, it is clear that the Department of Solid Waste Management faces institutional obstacles in the way of future development.
- **The University of Memphis** — a state school in a city that is behind in green practices — faces the challenge of "implementation lag." Due to a lack of resources and communication with players outside the university system, the university

struggles to keep up with the national precedents set around sustainability. For example, their most recent breakthrough in sustainability was converting their light fixtures to LED — a beneficial shift that they admit could have occurred earlier. They also voiced their frustration with the state of recycling in the city. However, with more access to the public and private sectors, the university and the intellectual power behind it could offer the action needed to implement certain practices.

Another vein our team explored with the University is their connection to the previous Sustainability Advisory Committee that existed in Memphis. Former Shelby County Mayor Lutrell appointed this committee in 2011 which dissolved in 2015; feedback from individuals at the university indicate that the committee was unsuccessful due to waning participation and lack of oversight and direction. They also noted that the re-initiation of a council of this nature could rouse more action now as the climate around sustainability has changed since 2015. Furthermore, starting with smaller steps and action items would encourage potential members to continue working towards a greener Memphis.

- Formed in 2015 via city charter, the Blight Elimination Steering Team (BEST) — housed by **Neighborhood Preservation Inc. (NPI)** — is a useful model for collaborative change around a civic issue. The team strives to boost collaboration and coordination of resources among private and public organizations working on blight elimination through monthly meetings, action plans, data analysis support, and other resources. Our team met with an NPI representative to investigate whether this model could be applied to sustainability efforts.
- After acquiring the 80-year-old Kroger bakery manufacturing building that was vacant since 1999, **Refurban** now operates its wide portfolio of circular economy concepts with the hopes of emerging as the state's largest minority business incubator. The site hosts around 30 employees for its materials management and recycling division for clothes, construction debris, office supplies, furniture, electronics, tires, raw materials, and many other streams of waste. One tour of the facility and the excitement and flood of ideas is clear. From creating dog houses out of construction debris to trash cans out of tires, Refurban is full of innovation in the world of sustainability. Last year, Refurban reported it diverted 82 tons of furniture

and electronic waste from landfills. The organization has also partnered with the city, county, and state governments in the past to sponsor recycling collection events and tire storage at its facility. Despite these apparent successes, Refurban has room to grow in scaling up its operation, narrowing its focus, and establishing trust through improved communication with relevant government agencies. In order to create large-scale impact, Refurban will likely need to either focus its efforts on one area or significantly boost investment in capital and labor. If it continues to grow in these areas, the organization will increase its credibility in Memphis and enable their innovations to actualize in the city's wider efforts.

- Early on in our team's process, we spoke with the investment firm **Closed Loop Partners**, which focuses their efforts on circular economies. They are not based in Memphis and have no connection to the city other than the zero-interest loan they provided in 2016 to make curbside recycling a reality. Using Closed Loops' loan of \$3,250,000, Mayor Jim Strickland's office brought single stream recycling carts to approximately 100,000 households in the first 100 days of his term. Although this was a clear political victory, the reality is that without also investing in curbside collection and materials processing, the city made less progress than expected. Furthermore, Closed Loop shared that while working in Memphis, they observed a need for capital investment at the local MRF and that the general political sphere is not conducive to sustainable innovation.
- As one of the prominent hospitals in Memphis, **Le Bonheur Children's Hospital** could have a large impact on the future of the city's waste stream. In our discussions with Le Bonheur, they expressed frustration at the lack of commercial recycling and indicated they would be receptive towards changes in the waste management system. They recognize both the vast amount of waste they produce by constantly hosting patients and doctors and the need to channel that waste in a more sustainable direction. Because hospital waste is often contaminated, the possibility of recycling at Le Bonheur is currently too expensive to consider—especially while aiming to provide affordable care for patients. That being said, the hospital expressed interest in investing in recycling practices in the future if it were easier and most cost-efficient. The hospital also noted that they have limited communication across the city and typically only connect with the other large

hospital, St. Jude Children's Research Hospital. Therefore, Le Bonheur would be interested in broadening the platform of communication around sustainability in the city to encapsulate a wider audience.

- **The Downtown Memphis Commission** was created by the city and county in 1977 and has since worked to revitalize downtown Memphis economically and culturally. While they do not directly focus on sustainability, they consider it a factor when bringing progress to the downtown area. The commission was able to provide our team with the business perspective and the economic factors that must be considered when creating initiative in the city. Based on our meeting with their representative, we altered our focus and research to include equity and economic growth.
- Naturally, job creation and economic growth is important to **the Chamber of Commerce**. Moreover, the Chamber sees sustainability and economic growth as complementary if executed in the correct way. They supported creating employment opportunities through local circular economies that keep money in the city. With this in mind, the Chamber is a potential partner for projects creating green jobs.
- **Clean Memphis**, a prominent nonprofit organization in the city, focuses on creating a cleaner, greener, and more environmentally sustainable Memphis. A notable subset of their organization is Project Green Fork, a certification program which encourages recycling and waste reduction among Memphis' restaurants and other establishments. Clean Memphis notes the urgency of the city's solid waste issues and emphasized the emotional connection many people have towards food waste specifically. Clean Memphis already harnesses a large amount of the population's energy around sustainability and could increase their impact if they coordinated with more players in the city.
- **GetGreen** strives to fill the commercial recycling gap in Memphis by independently transferring recyclables from businesses to the MRF. Although this gap is a critical space for the city to fill, the organization believes it needs to significantly scale up in order to create the change needed in the city. Scaling up is particularly challenging

for the organization because where it used to see depositing revenue from the MRF, the organization now experiences revenue loss due to high tipping fees. GetGreen is an example of an organization striving to take on the city's problems but one that faces challenges due to the confines of the structural obstacles in place.

- Our team had the opportunity to meet with **Shelby County Mayor Lee Harris** and representatives from his office on two occasions to gauge interest in sponsoring a sustainability-focused council for the region. In preliminary discussions, the office seemed interested in the concept and advised our team to draw private sector buy-in before pitching to Mayor Harris. After AutoZone's sustainability representatives expressed interest, our team circled back with the office (with in-person support from the Office of Sustainability and its Climate Action Plan) to pitch the concept to the mayor. Mayor Harris expressed concerns that the council was more of a political opportunity for people than an actionable way to push issues forward. While he acknowledged that people could easily support the idea of a sustainability council, he ultimately believed councils are generally less effective than intended to be. However, he also recognized the lack of sustainability-related communication between sectors and agrees that this issue should be addressed.

Beyond the presentation, the mayor was generally unaware of the Climate Action Plan and the work of the Office of Sustainability. This proved to be an obstacle in our discussion and represents a need for greater communication between players in Memphis.

Themes

After our team's extensive field research, we noticed several overarching themes during our discussion with industry leaders around Memphis. Regardless of sector, most of the individuals we interviewed expressed similar concerns about the state of solid waste management and sustainability efforts in Memphis.

These themes include:

- Disinvestment in infrastructure
- Lack of markets for recycled goods
- Lack of equitable programs
- Need for increased public-private communication

Most industry leaders bemoaned disinvestment in waste management infrastructure in the city — particularly the absence of commercial recycling services and the inefficiency of the MRF. People involved in the recycling industry also noted how the lack of an end-market for recycled goods drives down the profitability of their businesses and interferes with the economic feasibility of recycling. Additionally, many leaders highlighted the issues of equity in the field. Specifically, one challenge is the fact that low-income communities often disproportionately bear the brunt of environmental damage, despite usually having less impact on the environment than more affluent groups. For example, low-income groups contribute less to air pollution, driving and using less energy than more wealthy groups. However, according to a Yale University Study, low-income areas are often closer to high-traffic and high emissions areas, like freeways and rail yards. These individuals are exposed to more particulates and experience higher incidences of asthma as a result. The environmental conditions are exacerbated by a lack of information and educational efforts in these communities, leaving residents without the knowledge needed to protect the health of their families. The recycling and waste management industries often do not take into account the needs of these traditionally marginalized communities, resulting in the voices of large groups of Memphians being ignored. Another theme that consistently arose

in over our meetings was the negligible communication between the public, nonprofit, and private sectors and the resulting poor coordination of sustainability efforts in the region.

As we tried to maximize our impact around this multifaceted issue in a mere eight weeks, we kept these main themes in mind while considering potential projects to undertake — all in hopes of moving the needle on the state of sustainability in Memphis.

Brainstorming and Initial Attempts

After extensively researching circular economies, our group began to consider the implementation of some aspects of a circular economy in some of the waste streams Memphis struggled with most — such as tires, glass, and food. Our first idea was to try to find innovative methods to repurpose these materials and close their specific economic loops.

Tires

Through our conversations, our team realized that tire waste was a monumental issue in Memphis. When tires wear out after years of use, they become a tough-to-tackle problem that plagues waste management infrastructure in big cities and small towns all across America. They are bulky in landfills, hard to shred, expensive to repurpose, and hazardous as waste.

However, Memphis seems to be particularly affected by this issue. After only a few days in the city, a visitor will notice mounds of tires on the side of the roads, in medians, and cluttering up vacant lots. These tires pose a public health hazard as they leach toxic chemicals into groundwater, contribute to urban blight, and collect rainwater that creates an ideal breeding ground for mosquitoes and other disease-carrying insects. Memphis's tire problem is long-standing and complex. In 1991, Tennessee's Solid Waste Management Act created the Waste Tire Program that banned whole tires from being disposed in Tennessee landfills. Although well-intended, without a well-defined alternative to landfills, this policy had the unintended impact of tires accumulating on the streets.

The only solution Memphis currently utilizes is sending its tires to a shredder. This solution involves paying Liberty Tires — the lone tire recycling company in the city — to transport the tires to facilities hours away in Eastern Tennessee and Alabama. There, the tires are shredded and transported back to Memphis. City officials must then find a use for the crumb rubber, but they often pay another company to take it off their hands. The tire waste stream strains city, state, and county government budgets every year with high transportation and disposal costs, and its overall inefficiency leads to increased urban blight.

After speaking with people involved in the tire disposal industry, including Philip Davis, Director of Solid Waste for the City of Memphis, and Devin James, Founder and CEO of ReFurban, we began to realize the systematic challenges that prevented the optimization of the tire waste stream. The equipment required to shred tires and convert them to a useful product is quite expensive — an initial investment of almost two million dollars. This expense can be prohibitive for startup founders like James — whose company collects tires for the city on a contract basis — even when they see the potential economic value in providing tire-shredding services here in the Mid-South. Additionally, it can be difficult to ensure the shredded tires will have an end buyer — technologies that convert crumbed rubber into useful products like asphalt aggregate and walking trails are still in their infancy, and an investment in a shredder could be risky if there is no way to transport the shredded tires.

Food waste

Another core component of the Memphis waste stream is food waste. Forty percent of food in America is wasted, and Memphis is no exception to this rule. In many instances, farmers are forced to dispose of large portions of their perfectly edible crops, simply because these fruits or vegetables do not meet cosmetic standards set by grocery stores and distributors. Grocery stores also often have large quantities of food they are unable to sell, and this becomes waste rather than being repurposed or donated. Our group was hoping to redirect this potentially wasted food to a food pantry, transform it into animal feed, or send the food to a composting facility.

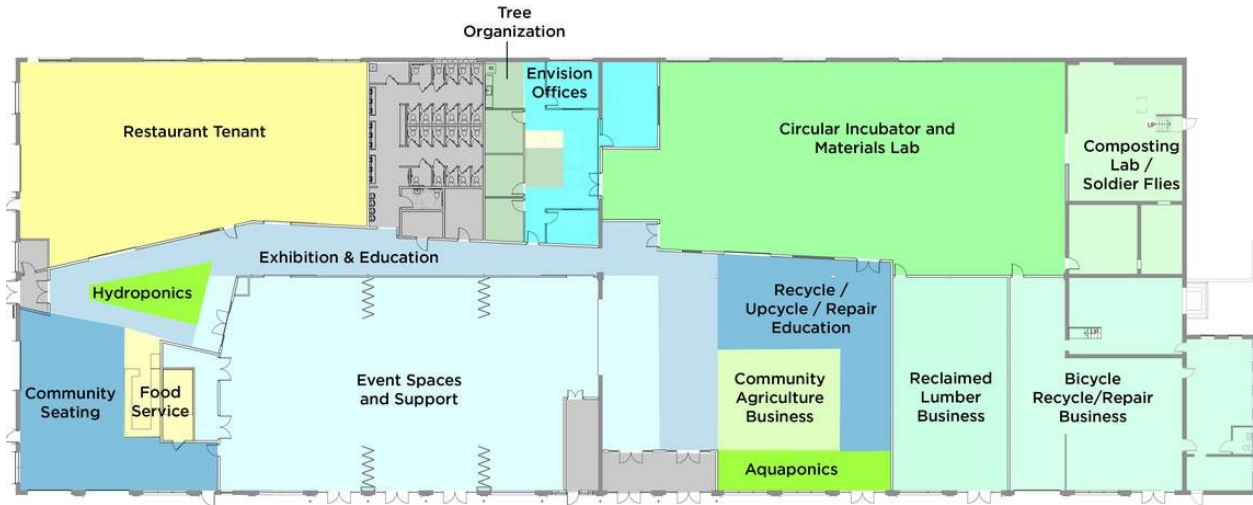
We quickly realized there were many barriers to finding a new life for food. As expected, there were many legal regulations put in place to ensure the quality of food sent to food pantries or used as animal feed. In order to turn traditionally wasted food into animal feed, the food products need to be dehydrated, which would require expensive dehydration equipment. Although some Memphis facilities, including the prison system, own and operate a dehydrator, expanding its use would be a challenging task — and one our group would not be able to take on during our eight weeks in Memphis. If we had tried to redirect unused or unsold food from producers or grocery stores to a food pantry, we would face the logistical challenges of transporting the food to the pantry and ensuring the food was safe to consume. All of this work would require time and labor that grocery stores often are

not willing to endure. Although we attempted to contact grocery store chains, such as Kroger, multiple times, we were unable to arrange a meeting. Also, participating companies would likely want to avoid the risk of unintentionally providing a food pantry with spoiled food and opening themselves up to a lawsuit.

Our final thought was to use wasted food as compost for local farms. In order for the food waste to be turned into nutritious topsoil, the food would have to decompose in an industrial composter under carefully controlled aerobic conditions. Our team realized with the amount of food being wasted and the lack of local end-users willing to purchase the compost, the city could end up with a large pile of compost and nowhere to send it. With all our ideas regarding the food waste stream coming to dead ends, our team shifted gears from trying to close a loop to exploring solutions that would attack waste problems at its core and fit into the region's existing sustainability efforts.

Connectivity solutions

As mentioned in the Themes section above, one of the overarching topics that was continuously brought up in our interviews was the lack of communication and coordination between the leaders of existing sustainability efforts. We felt this was an area our team could have an impact on, so we began to brainstorm ways to bring the energy and efforts of these leaders together. One of our first ideas was to create a physical hub where sustainable businesses and organizations would take some part in reducing waste or creating a circular economy in Memphis. This idea, inspired by Crosstown Concourse and Charlotte, NC's Innovation Barn, would encourage collaboration between nonprofits and businesses working in the field of sustainability. We envisioned a building with retail, research, and office space — a building able to host community outreach, education, engagement events, and other opportunities to push sustainable efforts forward.



Charlotte, NC's Innovation Barn Floor Plan

Beyond constructing a building, however, another potential method to facilitate collaboration among these leaders is an annual sustainability summit. This summit would bring together people from across the region and the nation to learn about existing sustainability efforts and how they can incorporate those ideas into their own work. In addition to bringing great ideas from across the country into the same space, this summit could help brand Memphis as a hub for sustainability and a center for future green innovation. This summit would require extensive planning in order for it to be as successful and well-executed as our team envisioned. Unfortunately, the four of us may not be the most well-equipped to undertake planning a project of this magnitude within our timeline.

However, the thought of bringing creative, motivated individuals together within the field of sustainability still presented an opportunity for our group to leave a lasting impact on the city. We also recognized the value of working within existing frameworks, rather than building new ideas from scratch. By creating a group of those already working on sustainability-related projects, they would have the resources to continue executing any plans we have made even after our departure from Memphis.

Sustainable Shelby Advisory Council

After considering the ideas mentioned in the previous section, we decided to pursue the creation of the Sustainable Shelby Advisory Council. This council would be formed to address the lack of private-public partnership, the need to coordinate efforts surrounding sustainability and provide a platform for diverse perspectives to be heard. Through our interviews, we realized that many of the leaders we spoke with could benefit greatly from increased communication with one another. Many of these individuals — even people working on similar projects — were unfamiliar with one another and had the potential to learn from each other’s successes and failures. By gathering these individuals together, they would be able to successfully bring their ideas to life. From this, the Sustainable Shelby Action Council was born. The council would provide a platform to promote dialogue that could spark innovative ways to address existing problems and discover creative solutions.

As we shared our idea for this council with sustainability leaders in Memphis, we discovered that there had been a similar council in the past. Founded by Mayor Luttrell in 2011, the Sustainability Advisory Committee was created by executive order and included representatives from the public and private sectors. Dubbed a Mayoral Advisory Committee, this group was to provide the mayor with their perspectives on sustainability issues facing the county. In meeting with people who had served on the now-disbanded committee, we gleaned that not as much had been accomplished as had been expected. Feeling a lack of progress, representatives from various organizations stopped attending meetings, causing the council to lose momentum. However, there was still hope from some individuals that a new council could form and be successful now that climate change has become a more pressing issue since 2011. As our group gained perspective from the shortcomings of the last council, we were able to form plans for a new council in a way that ensures past challenges would not resurface. By using a grassroots method to recruit members, rather than an executive order, we hoped the council members would maintain their motivation. The membership would consist of people already working on issues in the field and people whose work would be moved forward — not burdened — by the formation of a council. Ideally, the work of the council would coincide with the work of its members.

As we shared with our contacts how the new Sustainable Shelby Action Council would address the issues of the past council, we began to receive even more positive feedback from potential members. We were able to generate interest among private corporations, nonprofit leaders, and government officials, including the crucial support from the Office of Sustainability. Vivian Ekstrom, the Manager of the Memphis Shelby County Office of Sustainability, was interested in helping us progress our vision. She connected our team with the Shelby County Mayor’s Office and other key people around Memphis who could provide legitimacy to the council. Ekstrom also suggested that the council operate within the framework of the Office of Sustainability’s Climate Action Plan (CAP), a comprehensive document with goals for a more sustainable future in Memphis. Wanting to act on existing efforts, our team appreciated the opportunity to work within this plan. Following a review of the CAP, we agreed that it would serve as a reliable and ambitious framework for the council.

As our team outlined a vision for council, we drafted a mission statement and set of pillars and goals to guide the council.

Mission Statement

“The council strives to implement a sustainable and circular economy in the Mid-South through public-private collaboration and the implementation of programs with equity and growth lenses benefiting all Memphians.”

Pillars and Goals

- *Circular economy*



- Redefine waste as an asset
- Create and routinely update a solid waste asset map to improve the process of finding end users for materials
- Meet the goals of the Climate Action Plan with a circular economy in mind

- *Connectivity*



- Foster greater communication and community between sustainability professionals, community advocates, and relevant organizations

- *Connectivity (continued)*



- Provide a platform of engagement for the Shelby community to participate in the city's sustainability efforts, such as the Climate Action Plan
- Create and routinely update an organizational asset map to improve the coordination and division of responsibilities among relevant Memphis institutions

- *Equity*



- Prioritize sustainable programs and investments accessible to all Memphians
- Seek sustainable programs that will directly benefit traditionally marginalized communities
- Foster a sense of community among Memphians through a culture of environmental accountability

- *Economic Growth*



- Prioritize sustainable programs and investments that create jobs, growth, and general economic well being
- Understand and listen to the interests of private corporations in Shelby County — and strive for mutually beneficial programs and partnerships

- *Application*



- Through public and private collaboration, support the development of circular economy programs in Shelby County
- Maintain a close relationship with the Office of the Mayor to ensure coordination and mutually beneficial agendas
- Create systems of oversight for programs implemented by the council
- Support longevity of the council and its programs through systematic fundraising and grant-writing
- Perform routine self-evaluations to ensure the council's direction, programs, and goals are in line with original mission statement and the Climate Action Plan

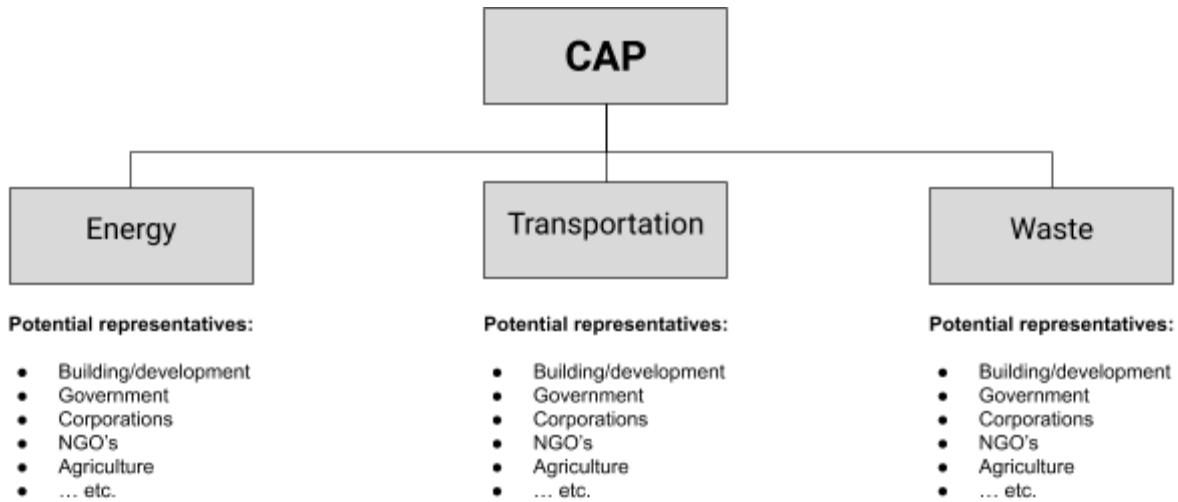
We arranged a meeting with the Shelby County mayor, Mayor Lee Harris, to present the finalized details of this plan. We were hoping to gain support or endorsement from the mayor in order to make the council more marketable to potential council members. Although Mayor Lee Harris' administration certainly cares about climate change and

sustainability issues, his office wanted to ensure this council would be impactful and effective — rather than a political point for members — before providing his backing.

Our next steps were to find ways to organize the CAP into smaller, more achievable goals that could be accomplished quickly and help the council maintain momentum, along with developing an organizational structure and bylaws to help the council run smoothly.

Working with Janet Boscarino (Project Green Fork, Clean Memphis), Vivian Ekstrom (Office of Sustainability), and Jenna Thompson (University of Memphis), along with our advisor Suzanne Carlson (Innovate Memphis), we developed several potential structural models for the council.

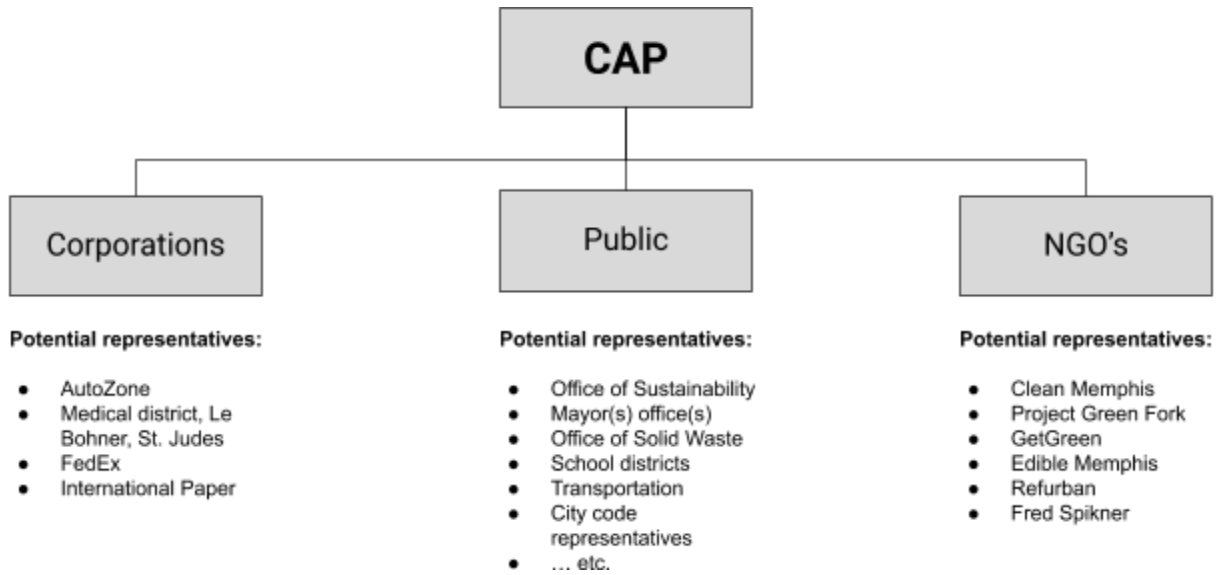
Model 1: CAP Top-to-Bottom



Model 1 Details

- Divided into three subcommittees based on the three sectors of CAP
- Energy, Transportation, and Waste committees will each elect one actionable goal every six month period
- Representatives from various industries are assigned to each committee
- The council will additionally facilitate breakout workshops biannually for members (e.g. corporation, NGO, special-topic workshops). This is to give members more opportunities to connect with council members and provide resources specific to varied interests.

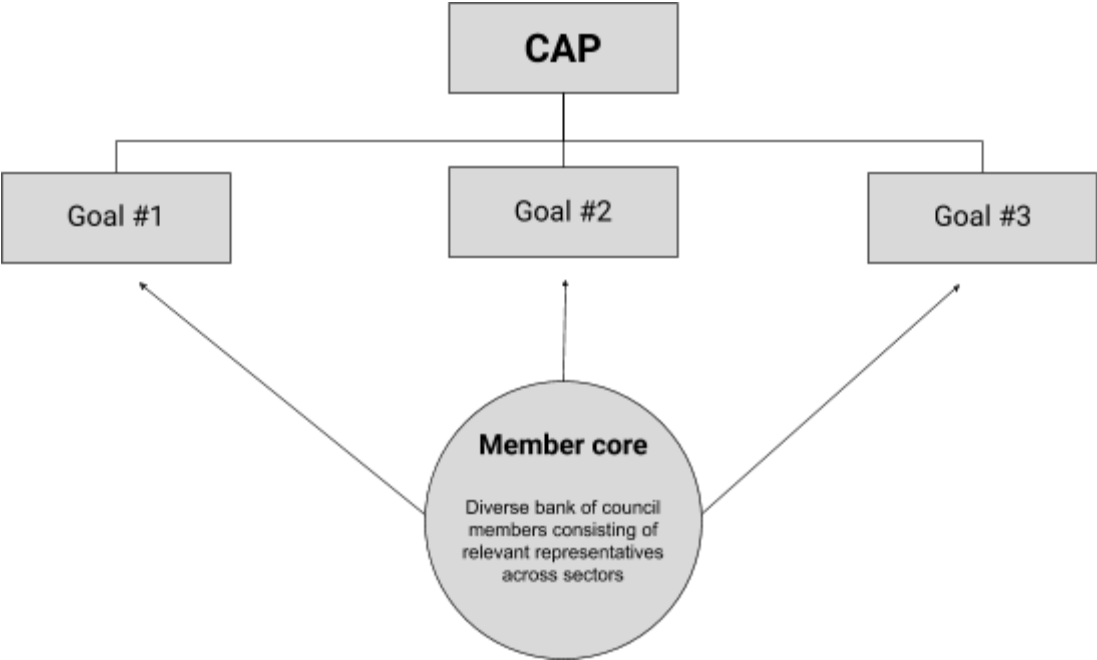
Model 2: CAP Bottom-to-Top



Model 2 Details

- Divided into three subcommittees based on sectors of influence
- Corporations, Public, and NGO committees will each elect one actionable goal every six month period to move any aspect of the CAP forward
- Members divided into spheres with similar struggles, resources, and goals

Model 3: Issue-based



Model 3 Details

- Council meets every six months to generate goals/renew existing goals through voting system laid out in bylaws; each goal would be actionable and would align with the pillars of the CAP
- After the biannual meeting, members split into three subcommittees: one for each elected goal
- Members can rank each of the three goals by preference and executive members will use those preferences to make each group while striving for diverse perspectives in each (each member may not be placed into their first option)
- The council will additionally facilitate breakout workshops biannually for members (e.g. corporation, NGO, special-topic workshops). This is to give members more opportunities to connect with council members and provide resources specific to varied interests

Actionable Goals from the Climate Action Plan

Since our meeting with the mayor, we have been working on compiling our research for Vivian Ekstrom, manager of the Office of Sustainability, in hopes that she will be able to use our research and brainstorming to begin implementing one of these models or a similar plan after our departure. After reading the Climate Action Plan, our group identified a few manageable goals that Vivian and her partners could work on. Below each actionable goal, we listed a few steps that they would have to take in order to implement those goals. These goals can be found on the following pages.

Energy

CAP Implementation Step	Team's proposed action items
<p><i>Establish a regular and frequent review process for updating building and energy codes to ensure compliance with the latest green building standards</i></p>	<ul style="list-style-type: none"> ● Work with the Department of Housing and Urban Development to review existing codes ● Determine achievable green building standards ● Update the code to reflect those green building standards ● Improve current code enforcement techniques
<p><i>Aggressively pursue additional funding sources — both public and private — to expand existing weatherization programs for low-income residents</i></p>	<ul style="list-style-type: none"> ● Identify existing weatherization programs that have the ability to expand ● Determine possible sources of funding ● Develop a grant request ● Allocate funding to existing programs on the basis of their potential impact

<p><i>Provide resources to the commercial sector on energy tracking tools in preparation for a commercial energy reduction challenge</i></p>	<ul style="list-style-type: none"> ● Research past campaigns that were successful in reducing energy usage ● Compile information about energy tracking tools and reduction strategies ● Distribute the research to the commercial sector ● Develop an energy reduction challenge ● Determine incentives and metrics for the challenge
<p><i>Research best practices and approaches for comprehensive street light retrofit programs in other cities</i></p>	<ul style="list-style-type: none"> ● Explore streetlight-retrofitting strategies of sister cities ● Determine which strategies would work best for Memphis ● Extrapolate research to begin a cost-benefit analysis for a complete streetlight retrofitting project
<p><i>Develop robust local marketing efforts that provide information on existing federal tax credits available for energy star product purchases and renewable energy insulation</i></p>	<ul style="list-style-type: none"> ● Research tax credits available for energy star product purchases ● Develop marketing strategies to encourage purchase and installation of Energy Star appliances and renewable energy tech ● Implement a marketing campaign using social media and educational workshops to disseminate information about the financial benefits of these technologies

Transportation

CAP Implementation Step	Team's proposed action items
<i>Ensure the transit passes are easy to purchase and cost the same or less than parking</i>	<ul style="list-style-type: none"> ● Collaborate with city legislators to increase parking management and fees ● Incentivize the use of public transportation in order to drive down the costs of transit passes
<i>Require more robust bicycle parking and storage in commercial, multi-family, and mixed-use developments</i>	<ul style="list-style-type: none"> ● Determine high-traffic bike routes and where bicycle parking would be most useful ● Calculate costs for installing all bike racks ● Draft a pitch for purchasing and installing bike racks across the city ● Pitch to the city council
<i>Replace minimum parking requirements with maximum parking requirements, or even eliminate any type of parking requirements</i>	<ul style="list-style-type: none"> ● Research existing minimum parking requirements ● Research other cities that have maximum parking requirements to develop a target maximum parking requirement
<i>Prioritize pedestrian and bicycle safety infrastructure investments in the following areas: activities centers with higher numbers of pedestrians, cyclists, and transit riders; low-income communities; Memphis 3.0...</i>	<ul style="list-style-type: none"> ● Locate areas in need of safety infrastructure ● Identify solutions and types of infrastructure that can address the safety concerns of pedestrians and

<p><i>(continued) ...anchors; and areas with high incidences of pedestrian/cyclist injuries and fatalities</i></p>	<p>cyclists such as crosswalks, bike lanes, and crossing lights</p> <ul style="list-style-type: none"> ● Partner with the Office of Public Works and City Council to construct the safety measures identified in the previous bullet point
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Solid Waste

CAP Implementation Step	Team's proposed action items
<p><i>Expand municipal composting facility capacity or consider contraction with a private composting facility for this service</i></p>	<ul style="list-style-type: none"> ● Analysis of current composting facility to determine areas of improvement ● Investigate different companies active in the field of organic waste management ● Execute a cost-benefit analysis of recruiting an outside company to handle Memphis's compost vs scaling up the existing municipal facility ● Explore funding options for scale-up or incentives for outside companies ● Encourage the community to take advantage of the composting facility through a campaign
<p><i>Explore the development of programs and incentives to encourage increased paper/cardboard recycling and food waste...</i></p>	<ul style="list-style-type: none"> ● Research similar efforts of other cities that are comparable to

<p><i>(continued) ... composting for commercial, institutional, and industrials sectors, including specific-use or industry themed competitions or challenges</i></p>	<p>Memphis to learn from their successes and failures</p> <ul style="list-style-type: none"> ● Target one sector and meet with representatives from that sector to determine which areas have the potential for the greatest impact ● Develop a competition/incentives to encourage recycling ● Publicize the competition/incentives and build buy-in ● Track progress and use the data towards CAP metrics and the creation of similar competitions for other sectors ● Repeat for another sector
<p><i>Improve and develop public awareness and behavior change campaigns in the short-term to minimize single-use plastics</i></p>	<ul style="list-style-type: none"> ● Research the harmful effects of single-use plastics on the environment ● Research alternative products and behaviors that can be implemented to phase-out single-use plastics. ● Research successful methods of raising awareness and bringing about behavior change (brochure, website, etc) ● Compile research in an easy-to-read format based o ● Distribute literature to the community

Summary and Thanks

Over the course of our team's summer in Memphis, we were able to gain a unique perspective on the state of sustainability in the city. By meeting with representatives from public, private, and nonprofit corporations, we were able to understand the complexity of these issues and how sustainability fits into Memphis' unique culture. Efforts by organizations to adopt sustainable practices and become environmentally conscious are often complicated by politics, economics, and culture. One cannot attempt to improve sustainability without addressing all of these spheres.

During our time here, we facilitated several mutually beneficial connections and conversations between relevant entities working in the field. Using this network, those groups will be able to both teach and learn from one another. Previously, players in the public sector were aware of one another's efforts and collaborated when possible. However, the resources of the private sector remained untapped. By connecting these entities, our team hopes to have jump-started a culture of increased communication and collaboration between public and private efforts to effect change in the Mid-South.

We would like to thank Innovate Memphis, the Hyde Family Foundation, and the Office of Sustainability for their advice and support as well as for connecting us with all the individuals who were essential to creating this network. We would also like to thank all of those we interviewed and allowed us to learn from their experience to gain a better understanding of Memphis's culture around sustainability.

Appendix

Contacts

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Sources

Closed Loop Fund Impact Report (2015 - 2016)

http://www.closedlooppartners.com/wp-content/uploads/2017/01/ClosedLoopFund-IR_FINAL.pdf

Climate Action Plan

<https://www.memphisclimateaction.com/draft-climate-action-plan>

Greenprint

<https://midsouthgreenprint.org/>

Innovation Barn

<https://www.charlotteobserver.com/news/business/article228226579.html>

Memphis 3.0

<https://www.memphis3point0.com/>

Solid Waste Management Act of 1991

https://trace.tennessee.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1350&context=utk_mtastech