City of Knoxville, Tennessee
Mayor's Department of Policy & Communications, Energy & Sustainability Office

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CITY OF KNOXVILLE

Knoxville's Energy & Sustainability Work Plan

Recommendations for the Mayor by the Energy and Sustainability Task Force

2007 - 2010 Energy & Sustainability Task Force Members:

- Alcoa Inc. (Walt Brockway)
- Foundation for Global Sustainability (Rikki Hall)
- Knox County (Lynne Liddington)
- Knoxville Chamber (Sam Hart)
- Knoxville City Council (Chris Woodhull)
- Knoxville's Community Development Corporation (Art Cate)
- Knoxville Utilities Board (Susan Edwards)
- Knoxville-Knox County Metropolitan Planning Commission (Mark Donaldson)
- Lindquist Environmental Appalachian Foundation (Pat Hudson)
- Knoxville-Knox County Metropolitan Planning Commission (Mark Donaldson)
- Oak Ridge National Laboratory (Dana Christensen)
- Public Building Authority (Jeff Galyon)
- Southern Alliance for Clean Energy (Stephen Smith)
- Tennessee Valley Authority (Al Nadley)
- University of Tennessee (Clif Woods)
- U.S. Green Building Council, East TN Chapter (Elizabeth Eason)

Special thanks to the volunteers who attended meetings, provided input, and invested:

- **Community Involvement Group led by Emily Woodle**

Annette Gomberg, Art Cate, Brad Coburn, Chris Woodhull, John Harris, Joyce Floyd, Justin Kropff, Pat Hudson, Sam Hart

- **Energy Group led by Sam Gomberg**

Jason Estes, Jeff Galyon, Rick Held, Susan Edwards, Stephen Smith, Tom King, Tom Rose, Zane Foraker

- **Goods and Services Group led by Drew Thurman, Native and Edible Landscapes subgroup led by Sarah Bush, Sustainable Purchasing subgroup led by David Griffin, Recycling subgroup led by John Homa**

Allison Teeters, Barry Marshall, Ben Epperson, Carol Evans, Catherine Wilt, Chad Weth, Charlotte Tolley, Chris Gallop, Darrell Shepard, David Brace, David Griffin, Derek Senter, Donna Schmidt, Douglas McGill, Frank Sewell, Greg Wittbecker, Jack Horner, Jay Price, Jennifer Linginfelter, Joe Walsh, Kevin Levy, Khann Chov, Kris Waldhauser, Liz Moniz, Liz Nother, Mark Penland, Matt Butzlaff, Micah Reynolds, Mike Harriss, Nikida Koraly, Peg Beute, Robert Rosenbaum, Sabrina DeVault, Stephanie Anderson, Stephanie Welch, Steve LaFollete, Thomas Hankins, Tom Spriggs

- **Infrastructure Group led by Wayne Blasius**

Jason Elliott, Jeff Galyon, Karen McKeehan, Susan Edwards, Trey Benefield, Zane Foraker, Brent Johnson, Steve King

- **Sustainable Growth Group led by Erin Burns Gill and Jake Tisinger**

Elizabeth Eason, Erin Burns, Gill Melear-Hough, Glen Richters, Jake Tisinger, Jeff Galyon, Keith Richardson

- **Transportation Group led by Pat Mulligan**

.

Alisa Ashori, Cindy McGinnis, Dave Murphy, David Reister, Ellen Zavisca, Gordie Bennett, Jeff Welch, Jonathan Overly, Johnny Green, Keith Kahl, Kelley Segars, Pat Hu, Ellie Elster

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Vision, Goals, and Priority Setting

Knoxville's Vision

The work of the Energy & Sustainability Task Force reflected the global effort to reduce excess energy consumption and standardize environmentally sustainable best practices. The Task Force researched best practices and advised City government in planning and implementing practical policies and programs through which the City of Knoxville may, by example, lead our community and our region towards an environmentally, socially, and economically healthy future.

Knoxville's Goals

Six volunteer work groups distilled the broad goals of the City's 2009 Energy Inventory into specific and detailed action items. These groups provided prioritized recommendations to the City in October 2010, which were approved by the Task Force Members and then complied to create the City's Energy & Sustainability work plan for the next 5 years, with already implemented and longer-term action items noted.

The work plan is the City's road map to becoming more efficient and responsible in its operations and growth, and in some cases will require political will from City Council and financial capital from City leaders to ensure effective implementation. The work plan is based on the Work Group scopes which include the following:

- Community Involvement: To determine the best way for the City and community to effectively work together on energy and environmental issues.

- Energy: To explore municipal, commercial, and residential energy saving opportunities, especially financing options to encourage private sector undertaking of building upgrades.

- Goods & Services: To recommend the best ways for the City to begin purchasing sustainably, to work through legal issues to enable edible landscaping and community gardens, and to recommend recycling best practices at events, in parks, in downtown, and in municipal facilities.

- Infrastructure: To work closely with applicable City departments to evaluate impacts of current City design practices; to research and recommend affordable and practical ways to incorporate sustainability into elements of street design, public parking facilities, and public park lands.

- Sustainable Growth: To identify steps necessary to modify zoning, subdivision regulations, and building codes so as to encourage, not prohibit sustainable development and growth.

- Transportation: To recommend affordable and practical ways to encourage commuting and reduction of fuel consumption in Knoxville through a car sharing program, development of a green fleet policy, and enforcement of the current no idling policy.

These Work Groups were charged with producing a set of well-formulated policy recommendations, thoroughly thought out and researched with respect to implementation. Policy proposals were developed around a provided proposal framework, and prioritized by timeframe to accomplishment. All recommendations are integrated in this work plan, which is a living document intended to reflect the progress of the City and community in our efforts to make growth decisions based on economic, environmental, and social considerations.

Some of the work group's actions were implemented while in progress because there was not a need for major political, departmental, or financial commitments; these are noted in the group's summary in order to capture and record that progress. In some cases, subgroups were created for implementation of these items.

Developing policy recommendations is different than implementing policy changes. Policy recommendations may have to be approved by several departments, independent agencies, elected officials, or even require approval, coordination, and changes to similar institutions within multiple jurisdictions. The data collected as part of the policy recommendation process will greatly streamline and speed up the adoption of proposed polices and programs and the resulting work plan will serve as a guide for the City to further promote environmental responsibility in both municipal government and our community.

The Task Force has created a plan that addresses the following 14 goals from the 2009 Energy Inventory:

1. Reduce energy and water consumption at all City facilities.
2. Improve the efficiency of traffic signals and streetlights.
3. Build new facilities that are energy efficient, environmentally friendly, and cost less to operate.
4. Reduce the amount of waste generated by municipal operations and purchase environmentally responsible products.
5. Reduce the fuel consumption, emissions, and maintenance of the city fleet.
6. Support Knoxville Area Transit's efforts to make their operations cleaner, greener, and more efficient.
7. Reduce vehicle-miles traveled by City employees during commutes to and from work.
8. Reduce transportation-related fuel consumption and emissions.
9. Improve the energy efficiency of local homes and buildings.
10. Grow the proportion of clean, renewable energy powering the Tennessee Valley's electricity grid.
11. Ensure the quality and quantity of local water supplies.
12. Reduce the amount of waste sent to the landfill; reduce, reuse, and recycle wherever possible.
13. Integrate sustainability objectives into economic development outreach and job creation initiatives.
14. Encourage community engagement in sustainability efforts.

Knoxville's Action Item Priority Setting

- Timely response to stakeholder requests for help comes first

- Put weight behind issues that already have momentum

- Tackle items that fit into available time, projects, and budgets before starting from scratch

- Pursue unfunded items with tenacity as funded projects are being implemented

- Quantify progress it contributes to overarching goals through regular community status reports

Letter from the Program Manager

Dear Friends,

A fine group of volunteers gave many months of personal time and effort to the creation of the City of Knoxville's first Energy & Sustainability Work Plan. These action items weren't just put on the table and left, they were carefully thought through in light of liabilities, budgets, maintenance, and political trends. Actions that made it into this plan make sense from economic, environmental, and social perspectives, will be used to measure progress, and push the City to continue to lead by example.

Some of the six work groups overlapped in their recommendations – most notably, the Infrastructure group, Sustainable Growth group, and Transportation group all recommended code revisions to encourage accommodation of multiple modes of transportation in the right of way. Those items are receiving priority attention. In the past months of compilation, I've been both encouraged at the progress that's been made and challenged by where we are headed.

For a young Energy and Sustainability program, Knoxville has taken some significant steps towards efficiency and environmental responsibility that have matured us quickly. Steps to progress are happening simultaneously, for example: the Task Force commissioned the energy inventory as the City was already negotiating our energy performance contract and capturing grant funding. The Task Force commissioned the work plan while two federal grants were already funding activities that made Knoxville emerge a leader in the southeast in solar capacity. The work plan was being written while 17 of 35 recommendations were already being implemented or completed. The work plan is being implemented while efforts to develop a comprehensive progress measurement system are underway.

We are fortunate as a City in more than just our reasonable cost of living and lovely natural environment; we are fortunate in having community members who care deeply about growing us responsibly. Throughout the process of charting a sustainable course, I've run into an old sentiment that "Knoxville never misses an opportunity to miss an opportunity". To that, I say: not true, not now, not on my watch, and not with the caliber of people I've had the pleasure to work with.

We, as a community, are doing more with less, are constantly striving to merge efforts, communicate, and improve. To those of you who participated in the efforts of the Task Force: thank you for your investment, it could not be done without you. To those of you who are reading this skeptically: hold us accountable, look for value added, and if you like the results, tell us and pitch in.

Sincerely,

Susanna Sutherland

Introduction

City Energy & Sustainability Challenge

Through its efforts to become more energy efficient and sustainable, the City hopes that Knoxville can become a place where the economy, the environment, and the community can thrive now and in the future. Although "sustainability" can be defined in a wide variety of ways, it is commonly understood as meeting the needs of the present without compromising the ability of future generations meeting their own needs. As a sustainable community, Knoxville will balance economic strength, environmental health, and community welfare.

The 2009 Energy Inventory identified some ambitious Green House Gas reduction goals:

- To reduce City government green house gas emissions 12% by 2012, 15% by 2015, 20% by 2020
- To reduce community wide green house gas emissions 20% by 2020

Reduction calculations will be based on the 2005 data used for the Inventory's baseline. The Inventory identified a myriad of next steps that could be undertaken to get Knoxville to those goals. This document further develops and augments a work plan to help achieve significant green house gas reductions and taxpayer savings; to being more effective and efficient in the way we operate daily.

City Energy & Sustainability Office Structure

The City's two Energy & Sustainability staff members are housed in the City's Policy and Communications Department in the Mayor's office, and are funded through the U.S. Department of Energy's American Recovery & Reinvestment Act and Energy & Conservation Block Grant, which expires in August 2012. While the block grant has specific scopes, goals, and activities, these positions are being leveraged to establish sustainable best practices into City government and the community.

In addition to the Task Force and grant scopes of work Energy & Sustainability staff are also involved in Department of Energy (DOE) funded electric vehicle infrastructure development, new grant application research and development, Light Emitting Diode (LED) streetlight rate and retrofit development, the University of Tennessee and Oak Ridge National Laboratory energy data and project collaborations, and daily community interaction. Staff averages 25 presentations annually to interested local and national groups and organizations.

City Energy & Sustainability Office Funding Sources and Scope of Work

The City's Energy & Sustainability efforts fall under the following categories:

1.) DOE's Solar America Cities Grant:

Work funded through the Solar America Cities grant was completed in 2011, with solar photovoltaic installations in the Knoxville area topping over one megawatt (1 MW) in 2010 (starting from ~15 kW in 2007). The solar grant funded 2 photovoltaic installations: 4.7 kW system on the Knoxville Station Transit Center and 1.4 kW system on the Knox Heritage House. The City of Knoxville has also funded and installed 2 solar hot water systems this year (one at the Heritage House, one in a private residence via Community Development) through this grant. By providing training and demonstration opportunities, the grant worked to reduce barriers to renewable energy in our area and participated in solar energy growing in this region from roughly 15 kW to over 1 MW in 3 years.

When 2008 solar capacity goals were created, there was 30 kW of capacity in the region. Knoxville aimed to increase capacity ten-fold (300 kW) by 2010 and 100-fold (3,000 kW or 3 MW) by 2015. At the end of 2010,

there was over 1,300 kW in the region. The goal of 3 MW by 2015 may be conservative given the capacity increase seen from 2008 - 2011, but much of that increase is a result of State grants as well as the Tennessee Valley Authority allowing 1 MW projects into their generation partners program.

Knoxville will likely need to see stronger support from TVA for large systems if we plan to reach a larger goal of 5 MW. At our current goal of 3 MW, there may already be some challenges. Acquiring 1,700 kW in four years when a common residential array is around 2 kW would mean 850 additional residential installations, or 212 installations per year over the next 4 years.

2.) Energy Efficiency and Conservation Block Grant:

Block grant funds are allocated into seven activities that include: sustainability staff salaries, a solar incentive and appliance rebate program, weatherization of 19 private middle-income residences, heating and cooling system replacements in 11 Fire Stations, Contractor Training in energy retrofits, marketing and bin purchase for the new City service of single stream recycling, and development of a third party financing model for renewable energy in the Tennessee Valley service territory.

3.) Energy & Sustainability Internal and External Partnerships:

Beyond the grants, City sustainability staff pursues a variety of inter-departmental projects and inter-agency partnerships. These include working with Department of Energy contractor ECOtality on state-wide public electric vehicle charging infrastructure, helping the City's Purchasing Department as needed with the Ameresco energy retrofit contract, facilitating and staffing the Energy & Sustainability Task Force's working groups, developing and maintaining the City's first sustainability work plan, working with Public Service and the Public Building Authority to launch downtown, park, and City-County single stream recycling programs, working with Knoxville's Utility Board on exploring energy efficient lighting programs, and coordinating with City's Community Development Department on the development of energy & sustainability related grant activities. Energy conservation and sustainable development efforts are rapidly becoming essential services in City operations across America. Sustainability staff ensures Knoxville has a national presence in this publicly demanded field, which has already begun to positively impact this area in terms of expanding our economic development opportunities.

In 2009, over $2,622,700 was captured in sustainability-related grants, with only $2,000 required in matching funds. A portion of the $2,012,700 in stimulus funds provided the initial funds for creation of the City's first Energy & Sustainability office through 2012. Additionally in 2010, Community Development through Knoxville's Regional Transportation Planning Organization was awarded a federal housing, transportation, and environment consortium grant for $4,300,000 to complete regional, sustainable, growth planning in this and four surrounding counties to be completed by 2013.

City Energy & Sustainability Work Completed To Date

- Recycling in City County Building:
  - Single stream bins on every floor with collection weight monitoring
  - Employee education and program promotion resulting in increased landfill diversion

- Recycling in Downtown:
  - Pilot program with Waste Connections started as pedestrian-based but captured more input from residences
  - Transitioning into a residential collection program provided by the City in October 2011

- Recycling in City Parks Pilot:
  - 2010 single stream containers in high volume ballparks with monitoring material and weight
  - Determined high-traffic parks are most cost-effective for long-term recycling

- Municipal Renewable Energy:
  - City owns 4.5 kW PV on the Transit Center, 28.5 kW and 90 kW on the Convention Center
  - City owns geothermal system at the Transit Center
  - Solar training, education and awareness were effective in increasing solar commerce
  - Improved market viability of solar (from ~15 kW to over 1 MW in 3 yrs)
  - City to provide incentives for solar hot water and PV in 2011

- Energy Efficient Streetlights:
  - LED pilots complete on Wall Ave., Blount Ave., Hill Ave., and Chilhowee Park
  - Working with utilities and Knox County to help set new rates for efficient light watchmen
  - Parking garages and stoplights are already converted to LED, saving over $250,000 annually

City Energy & Sustainability Work in Progress

- Ameresco Energy Performance Contract:
  - On-going energy efficient retrofits to save $1,100,000 annually
  - 13 year, $19,000,000 guaranteed return on investment to retrofit 99 City facilities
  - Ameresco works with local contractors to create local jobs whenever possible

- Energy Efficiency and Conservation Block Grant:
  - Activity 1: Sustainability Program Manager and Coordinator salaries
  - Activity 2: Appliance Rebate and Solar Incentive Program
  - Activity 3: Knoxville-Knox County Community Action Committee weatherization of 19 local middle income homes
  - Activity 4: Ameresco heating and air replacements in 11 fire stations
  - Activity 5: Contractor Workshops (Earthcraft and Energy Code Training)
  - Activity 6: Single Stream Recycling Marketing and Bin Purchase
  - Activity 7: Third Party Finance of Renewable Energy (90 kW on Convention Center)

- Single Stream Curbside Recycling as a tax-payer service:
  - $700,000 in block grant funds, program service costs from City capital
  - Program rollout in October 2011 preparing to initially serve 20,000 residents

- Task Force's Energy & Sustainability Inventory and Work Plan:
  - Sustainability office maintaining Energy Inventory and Work Plan
  - Identifies work by priority in 6 categories, a living guiding document
  - Measurement and verification of savings and reductions to be tracked by staff

- Sustainable Communities Grant:
  - Three-year effort to create a sustainable development plan for 5 area counties
  - Unique federal agency partnership to fund local planning partnership

- Car share program:
  - Partnership with the University of Tennessee and Knoxville's Transportation Authority
  - Program will be managed by a competitively bid contracted company
  - Will allow members to check out vehicles
  - Car-share parking spots will be located throughout campus and downtown Knoxville

- Electric Vehicle Charging Infrastructure:
  - Will host roughly 20 municipal charging stations by the end of 2012
  - Part of a national network of test markets for deploying charging infrastructure
  - 10 solar powered stations will be installed by Oak Ridge National Lab at Market Square and Coliseum garages

- Urban Agriculture:
  - Urban Hen and Goat ordinances passed in 2010
  - City Law Department is developing Community Garden ordinance and license
  - Community Development and Food Policy Council partnering on flow chart and how to guide

City Energy & Sustainability Long-term Goals

The City of Knoxville strives to be a leader in our community, our state, and our nation. We want to lead by example and continue to make decisions on how and where to grow in a manner that thoughtfully considers economics, our community, and our natural environment. Below are some examples of a longer vision beyond the work in progress and what's contained in this work plan.

- Grow single-stream recycling efforts and participation until our landfill waste is less than reclaimed
- Implement EV charging infrastructure installation, maintenance, and plan for the long-term
- Work with federal grants & agencies to incorporate local and regional sustainable development plans
- Increase energy efficient streetlight coverage in new and retrofit construction
- Instigate use of stormwater best practices for water conservation and quality improvements (examples: pervious pavement, increased planter bed sizes)
- Encourage varied transportation options by improving accessibility, improving public transit options, increasing and improving bicycle lanes, and maintaining walkable neighborhoods
- Update and maintain baseline Energy, Emissions, and Savings Inventory for progress monitoring
- Institutionalize sustainability staff and responsibilities throughout City departments
- Seek supplemental funding and partnership opportunities to further sustainability initiatives
- Track emissions and dollar savings captured from energy and sustainability initiatives

City Energy & Sustainability National Participation

The City of Knoxville participates as an Energy & Sustainability partner nationally whenever possible. Here are some examples of activities and organizations we support and contribute to with time and resources:

- Urban Sustainability Directors Network: serve on Financing Sustainability and Rental Efficiency Committees
- Local Governments for Sustainability (ICLEI): serve on conference planning and policy advisory committees
- U.S. Green Building Council: national and local chapter members
- South East Region City Network Coordination (non-affiliated): co-chairs with Asheville, NC
- National Academies: Committee for Incorporating Sustainability in the U.S. Environmental Protection Agency

Executive Summary

Based on next steps identified in the City's 2009 Energy Inventory, volunteers met during the course of 2010 with the Energy & Sustainability Task Force during an open process to brainstorm and identify the following 31 actions to comprise the City's Energy & Sustainability Work Plan:

Community Involvement

- Activity 1.1 Development of an Energy & Sustainability Implementation Advisory Board
- Activity 1.2 Develop a Citizen's How -To Guide to Sustainability
- Activity 1.3 Information Sharing: Building Community Support and Political Will
- Activity 1.4 Information Gathering: Identifying Community Concerns

Energy

- Activity 2.1 Green Building Code Incentives
- Activity 2.2 Streetlight, Light Watchmen, and Parking Garage Lighting Retrofits
- Activity 2.3 Revolving Loan Pilot for Residential Energy Retrofits
- Activity 2.4 Measurement & Education: Energy Manager Position

Goods and Services: Landscaping - Purchasing - Recycling

- Activity 3.1 Edibles in Right-of-Ways and Public Locations
- Activity 3.2 Encourage Home Landscaping with Natives and Edibles
- Activity 3.3 Community Gardens
- Activity 3.4 Employee Purchasing Guide
- Activity 3.5 Integrating Green Purchasing: Procurement Personnel Training
- Activity 3.6 Create a Sustainable Purchasing Staff Position
- Activity 3.7 Elimination of Unnecessary Disposables
- Activity 3.8 Recycling Services Contractual Framework
- Activity 3.9 Downtown Permanent Recycling
- Activity 3.10 Recycling in City Parks
- Activity 3.11 Event Recycling in Public Spaces
- Activity 3.12 Recycling in the City and County Facilities
- Activity 3.13 Electronic Waste Recycling

Infrastructure

- Activity 4.1 Subdivision Regulation Revision
- Activity 4.2 Plantings in Right of Way
- Activity 4.3 Multimodal Accommodation in Right of Way
- Activity 4.4 Utility Coordination in Right of Way

Sustainable Growth

- Activity 5.1 Knoxville-Knox County Metropolitan Planning Commission – City of Knoxville Interaction Policy Proposal
- Activity 5.2 Knoxville-Knox County Metropolitan Planning Commission Sustainable Code Policy Proposal
- Activity 5.3 Stormwater Utility Policy Proposal
- Activity 5.4 Building Code Updates

Transportation

- Activity 6.1 City and Community Idling Policy Implementation Strategy
- Activity 6.2 Bike Pool for City Employees
- Activity 6.3 Complimentary Buss Pass for Commuting City Employees
- Activity 6.4 City Staff Dedication to Promotion of Alternative Transit
- Activity 6.5 Develop a City of Knoxville Green Fleet Policy
- Activity 6.6 City Employee Promoting Alternative Transportation

At time of publication, many of these action items are either complete or in progress, and we continue to seek funding opportunities, partnerships, and innovative ways to grow our community in economically, environmentally, and socially responsible ways. A collaborative and living document, the work plan was designed to provide detailed and developed action items that bring us close to our goals to reduce City government green house gas emissions 12% by 2012, 15% by 2015, 20% by 2020, and to reduce community wide emissions 20% by 2020.

Work Plan

SIX STRATEGIES

COMMUNITY INVOLVEMENT
ENERGY
GOODS AND SERVICES
INFRASTRUCTURE
SUSTAINABLE GROWTH
TRANSPORTATION

Chapter 1: COMMUNITY INVOLVEMENT ACTION PLAN

Engaging the community is a priority of the City's Energy & Sustainability Office. A dialogue that allows the local administration to understand community priorities, and the community to understand reasoning behind municipal initiatives, enables us to be as effective as possible in creating a functioning, sustainable urban environment.

The City has already created some venues that allow for a variety of ways of both sending and receiving communication. These involve multimedia approaches to disseminating progress and assimilating comment intake: Facebook, Twitter, a sustainability blog, an active website, press releases, web-based surveys, engagement with local television stations, holding open Task Force meetings, and hosting public meetings when appropriate.

Community Involvement Group Inventory Follow Up

- How can we better engage the community
- Publicize progress and share lessons-learned from energy performance initiatives
- Publicize incentives and identify program participation drivers
- Continue to educate on the importance of renewable energy in our region
- Identify and develop targeted community engagement strategies
- Identify activities that require pursuit of grants and partnerships within organizations

Community Involvement Group Focus

The focus of the Community Involvement Group was to foster marketing, incentive and leveraging recommendations for community involvement to the City of Knoxville Energy and Sustainability Task Force.

Community Involvement Group Goals

To recommend to the Task Force an implementation strategy on three next steps from the Energy Inventory report:

- Marketing Task Force and City successes and engaging the community
- Developing incentives and program participation drivers
- Leveraging sustainability with community engagement, grants, and partnerships

Community Involvement Recommended Activities

The following recommendations are listed in order of priority, recognizing that no matter the outcome of Recommendation 1, Recommendations 2, 3, and 4 can be implemented. Implementation of the first recommendation is important, but depends greatly on the political climate.

Activity 1.1 Development of an Energy & Sustainability Implementation Advisory Board

Who: This board will involve five to eight citizens from all sectors who are committed to operationalizing and promoting sustainability in local government and in our community.

What: Fostering political support and obtaining City approval of recommendations from the Task Force will be the primary function of this group.

When: This group should meet at least quarterly, beginning in 2011.

Where: Meeting times & locations will be coordinated by the City's sustainability office, hosted by the City's Policy & Communications Department, which is a branch of the Mayor's office.

Why: The Task Force and its working groups have devoted significant time to developing an energy inventory and recommendations for implementation of the next steps indentified in the inventory. It is important to focus on the follow-through so this is not just another document, but actually guides the work. Approval by City Council will help solidify the City's decision to continue to be a leader in sustainability best practices, and to provide for successful sustainability initiatives within City government. The Advisory Board will guide work plan implementation and drive political support of Task Force recommendations.

How: This activity does not involve City funding, but does involve staff time in compiling a group (for example, staff who have lead the Working Groups) who will support the sustainability office in implementing policy and operational changes within City government; the driver of these policy recommendations will continue to be driven by the triple bottom line - economics, equity, and the environment. This group should be volunteer-based with annual rotating commitments. Progress will be measured by number and effectiveness of initiatives undertaken and completed annually.

Resources & Case Studies: The Knox County Green Team is an example of local government convening regularly to determine priorities and effectiveness of energy and sustainability initiatives. Most municipalities involved in these types of efforts keep a small advisory group or Task Force on hand to aid in decision-making and transparency.

Activity 1.2 Develop a Citizen's How-To Guide to Sustainability

Who: The City worked with Knoxville-Knox County Community Action Committee(CAC) and its AmeriCorps staff to develop a how-to guide for citizens. Research was done to identify what resources exist currently, including incorporation of the City's energy inventory one-page excerpt, and the guide was created for use locally in both an electronic and hardcopy format.

What: The Citizen's Guide is a one-stop shop for educating on lifestyle habits that can be modified to reduce individual environmental impacts.

When: The Citizen's Guide draft is complete as of Work Plan publication, to be published online in 2011.

Where: Distribution will be as wide as possible and include a series of public outreach events (such as informational booths and even door-to-door canvassing by AmeriCorps staff). It will be distributed at special events such as Earthfest and will be available on CAC and City websites.

Why: Becoming sustainable as an urban environment takes commitment from everyone. Without citizen ownership of personal impact, we can't become truly efficient as a community. The purpose of developing a Citizen's How-To Guide for Sustainability is to provide a highly effective tool for personal energy use assessment and habit change implementation for citizens. The tool will be accessible to all citizens in Knoxville and Knox County. The objective of the Citizen's How-To Guide is to empower people to reduce energy consumption and raise awareness about energy use and what impacts are associated with energy consumption. Following creation of the basic Citizen's How-To Guide, one-page information sheets (factsheets) were developed for specific interests. These information sheets serve as an access point for interested citizens or groups to learn more about sustainability implementation in their homes or businesses.

How: This activity did not involve City funding. CAC AmeriCorps staff researched available citizens' guides, compiled general information, and individualized for Knoxville. Progress will be measured by posting and maintaining the document as a living source of information.

Resources & Case Studies: The Citizen's Guide was created based on a national research of similar documents and localized to accommodate regional applicability.

Activity 1.3 Information Sharing: Building Community Support and Political Will

Who: Building support requires active interaction between City staff, members of the media, and community members. Citizens who utilize social networking media will have more and direct access to the City's activities and have the opportunity to ask questions, make comments and participate in the City's process. Traditional methods of communication will also continue to be employed.

What: In order to ensure interaction with the community on sustainability initiatives and the City's progress, the City should utilize an integrated multimedia approach, including Facebook, Twitter, blogs, press releases, TV slots, and community meetings.

When: As implementation of these recommendations progresses, ideas to inform and educate include use of billboards, radio and television public service announcements, as well as local publications such as City View, Metropulse, and Knoxville Magazine. For example, the City could partner with Channel 10 WBIR to post a survey on their website and do a brief story about the City's sustainability efforts.

Where: To share the City's efforts on sustainability in a more public manner, it's proposed the City's current Facebook page be utilized (over 3,000 followers), as well as Twitter (started August 2010) to communicate City environmental related activities. A popular tool for gathering information is to distribute an existing survey through an interface like Survey Monkey to poll and compile public opinion on specific issues. The survey data will be used to communicate community goals to City Council and the Administration.

Why: The goal of this recommendation is to communicate City energy and sustainability efforts to the community and obtain feedback to determine community priorities. This is crucial for the success of City sustainability initiatives, especially when it comes to building support of elected officials. The objective of getting the word out is to facilitate dialogue between City leaders and community members to build support for energy & sustainability initiatives.

How: This activity does not involve additional City funding or staff. The City's webmaster has agreed to post for the City on applicable networks; sustainability staff will continue to work directly with the Webmaster to create posts and manage feedback. Progress will be measured by continuation of the City's Energy & Sustainability initiatives at the end of 2012, when current funding is expended.

Resources & Case Studies: Utilization of multimedia to raise support is used in all sectors, and examples of cities that have successfully communicated and captured input abound. The best known is the City of Vancouver, Canada, which has so successfully engaged their citizens that they sold over 3,000 tickets to a public meeting intended to capture input for an update of their green initiatives.

Activity 1.4 Information Gathering: Identifying Community Concerns

Who: The Community Involvement Group took the initiative to develop tools for use by the City that will enable information capture. This process will be continued by the City's sustainability office.

What: A brief survey was developed by the group to begin gathering information about peoples' understanding and value for energy and sustainability issues both in their personal lives and within City government. The Community Involvement Group also created a one-page (front and back) informational document based on an

excerpt from the City's published Energy Inventory Report for distribution at a number of events. This document includes a short list of actions individuals can take to make a difference, and preceded the development of the full Citizen's How-To Guide. The survey and information sheet is only one element of information gathering (and sharing) that should take place as Knoxville transitions into a more sustainable community. By reaching out to Knoxvillians, the City encourages involvement in sustainability efforts taken by City government.

When: The results of the survey will be tracked by the City's Sustainability Program Office and new information gathering opportunities will be explored as opportunities arise.

Where: The survey should be made available in a variety of locations, such as schools, churches, shopping centers, City buildings, and online.

Why: It is of great importance to understand citizens' perspectives on energy and sustainability issues in Knoxville. Without understanding local mindsets and the reasons behind them, it is difficult to resonate with any kind of message. What works in Vancouver doesn't necessarily work in Knoxville.

How: This activity does not involve additional City funding. It is staff time intensive. Progress will be measured by number of comments collected from the community.

Resources & Case Studies: Development of Knoxville's South Waterfront Vision still serves as a good example of collecting citizen input and dialoguing with the community throughout a process.

8-10 Year Vision

As the sustainability initiative moves forward within City government, it will remain important for sustainability staff to continually evaluate the evolution of the process. Annual evaluation of progress and reworking the five-year plan will continue to shape the future of City government. Determining now what we want to see in our government in the next five to ten years will help guide decisions with results born over future generations. Knoxville has an opportunity to be a sustainability leader in Tennessee, the southeast, and nationally. As with any initiative, good communication is key to Knoxville's success in becoming more sustainable. It is crucial for the City of Knoxville to take a front seat leadership role in how our community embraces sustainability. The City should be seen as a leader working to break down information barriers that currently exist in our region and showcasing and demonstrating how practicing environmental and social responsibility makes economic sense. The group recognizes that fragmentation of efforts can result in duplicated work, and that Knoxville has a myriad of groups addressing multiple energy and sustainability concerns and issues in our region.

Though compiling an all-encompassing list is not the central focus of this group's recommendations, this group identified groups and organizations who are involved in energy and sustainability efforts in Knoxville and the surrounding areas. The City's Sustainability website contains links to these entities, as well as up-to-date information on City sustainability initiatives housed in all departments. For example, the City's Community Development Department focuses on affordable housing and requires at least Energy Star in new home construction and is implementing Earthcraft in rehabs and new construction. Working closely with Community Development is Knoxville-Knox County's Community Action Committee, a public agency serving the citizens of Knoxville and Knox County - especially seniors, low to moderate income families, the unemployed and underemployed, persons with disabilities, and other individuals with special need for services.

Also working with Community Development is Knoxville's Community Development Corporation, who entered into an Energy Performance Contract with first year savings totaling $934,190. New projects underway include a certified Enterprise Green Communities and LEED certified homes.

The bottom line demonstrated here is that there is a significant amount of effort going on in Knoxville and statewide to promote sustainable best practices, and City coordination and partnership whenever possible will maximize effectiveness and leverage funding opportunities.

Chapter 2: ENERGY ACTION PLAN

From 2008 to 2011, the City of Knoxville was part of the Solar America Cities Grant, funded by the Department of Energy. The completed grant work includes City ownership of two photovoltaic systems (a 4.5 kW system on top of the Transit Center and a 28.5 kW system on the Convention Center). The City has also negotiated a Third Party Finance of Renewable Energy which includes installing an additional 90 kW PV system on the roof of the Convention Center, a compliment to the 30 kW system already installed through the City's Energy Service Performance Contract. As part of the Solar Cities initiative, the City also provided effective education and increased training opportunities and awareness of solar energy potential. The City's work with the grant has improved market viability and has seen an increase in solar energy capacity in the Knoxville area from roughly 15 kW to over 1 MW in three years.

Another project that the City has targeted is improving the energy efficiency of the many City-owned facilities with aging infrastructure. The old technology in these facilities has been very inefficient, so the City contracted with Ameresco to inventory the facilities and complete a number of retrofits to improve efficiency and reduce energy costs. Currently, about 40% of these retrofits are complete, and the projected savings when the project is finished is $1,100,000 annually. In addition, Ameresco has already replaced the HVAC systems in 11 fire stations throughout the City. The contract with Ameresco is also working with local contractors in order to create more local jobs in the energy sector.

Efficient street lighting is also being explored in Knoxville. Currently, the City operates 29,630 street lights with annual electricity and maintenance costs of about $2,800,000. LED street lights were tested in a pilot project on Wall Avenue in downtown Knoxville as an alternative to the current High Pressure Sodium lights. LED street lights use about 94 watts per light, compared to the 310 watts used by the existing HPS lights. Estimated annual savings total around 946 kWh per light. Since completion of the installation on Wall Avenue, the new portion of Blount Avenue has been fitted with LED lights. Because these projects have been successful, the City has committed to utilizing energy efficient lighting in retrofits and new construction.

Projects like these move the City towards reduced and cleaner energy use. The ongoing community issue of weatherization of low and middle income homes has also been touched on through the local infusion of American Recovery and Reinvestment Act funds. Knoxville – Knox County Community Action Committee completed 1,547 weatherization jobs with $6,145,546 in those weatherization funds. They were originally awarded $4,953,475.00. Then, because of their ability to hit all goals under the State of Tennessee's sliding performance scale, they were awarded an additional $1,192,071. Because of the strength of this organization, the City sub-granted $200,000 to the Knoxville – Knox County Community Action Committee for middle income weatherization, a category that is vital but not traditionally funded. The City also sub-granted them $270,000 for a solar and appliance rebate program, which capitalized on already weatherized structures. Knoxville is represented on a national working group dedicated to creating policies and strategies for rental energy efficiency programs. Funding ongoing community weatherization is something activity 2.3 touches on.

Energy Group Inventory Follow Up

- Energy Efficiency Measures:
  - Streetlights - Evaluate options for streetlight upgrades and implement
  - City Structures – Parking garages and facilities not affected by Ameresco scope

- Civic Buildings/Structures:
  - Retrofitting existing facilities not covered by Ameresco
  - Extension of Ameresco energy management and controls to other buildings

Energy Group Focus

The Energy Group focus was to explore energy saving opportunities and to provide recommendations to the City of Knoxville Energy and Sustainability Task Force.

Energy Group Goals

To recommend to the Task Force an implementation strategy for the following:

- Developing efficiency incentives in small business/commercial and residential sectors
- Developing employee education for efficiency in civic buildings/structures
- Pushing appropriate legislation for Tennessee and exploring financial mechanisms to encourage energy efficiency measures in Knoxville

Energy Group Recommended Activities

Activity 2.1 Green Building Code Incentives

Who: This measure is intended to affect both residential and commercial property owners. Consumption, emissions and cost data for this sector are described in the Knoxville Energy Inventory. Certain incentives may require passage by the City Council. While not necessary, partnerships between the relevant City departments and members of the building community, such as the U.S. Green Building Council, may be useful in tailoring eligibility criteria that ensures high levels of efficiency while limiting unnecessary workloads on existing City staff. Outreach and education to local development and building communities will be necessary to market new incentives. The Building Inspections Department issuing incentives, in coordination with the City's Policy and Communications Department, will be the primary point for this initiative.

What: Non-fiscal code incentives are designed to minimize impact on City expenditures and not realize a decrease in permitting fees. The specific incentives to be offered must be decided upon. It is recommended that administrative City staff from Building Inspections and Policy and Communications be involved in the selection process. Decisions on what to include by way of encouragement to the private sector for creating new efficient structures or retrofitting for efficiency should make financial sense for both the City and the private party.

When: Current City staff using existing resources could begin development of this program immediately. As incentives become more popular and City staff becomes more comfortable with the program, additional incentives can be integrated into the program.

Where: The City's Building Inspections Department, with help from partners and sustainability staff, could develop and implement most of the programs detailed below with little to no additional cost or effort. Managers can make final decisions on specific incentives to make sure they are best aligned with departmental objectives. There could be an online clearinghouse for local clean energy projects for public research and education. The data necessary to maintain the clearinghouse would be collected through the implementation of the codes/zoning incentives program. As data is collected, City staff (a small percentage of an existing employee's time) would maintain the data in a format that facilitates sharing with the general public for educational purposes.

Why: The Knoxville code and zoning incentives program and database for sustainable construction and renewable energy installation is a way for the City to increase its engagement with the local development and construction industries and increase use of sustainable building best practices, including the installation of

renewable energy technologies, throughout the City of Knoxville. By offering non-financial incentives, combined with greater engagement by the codes and zoning divisions, this program will increase the use of sustainable construction practices. It will also simultaneously increase demand for sustainable construction practices by providing Knoxville citizens with the tools and information to make energy smart choices.

Nationally, buildings account for nearly 40% of the energy consumed. According to Knoxville's Energy Inventory, residential and commercial buildings account for more than 40% of the City's green house gas emissions. This policy proposal is intended to achieve reductions in energy use in these sectors. Future business-as-usual trends will not accelerate market penetration of sustainable construction practices due to a lack of awareness on the part of consumers, combined with a lack of education and incentives for the construction industry. This program attempts to alter these trends and accelerate the adoption of sustainable construction practices through incentives for the construction industry combined with education and outreach to the community.

The implementation of this program will reduce energy consumption, reduce cost for clean energy projects, reduce emissions, and therefore increase the sustainability of Knoxville. Offering codes incentives to developers of energy efficient construction and renewable energy installations will lead to greater penetration of these construction practices, because each potential incentive reduces cost for the developer in some capacity. In turn, the increased penetration of these practices will reduce energy demand, thereby reducing carbon dioxide and other air pollutant emissions. The wide range of benefits provided by energy efficiency and renewable energy are detailed in the City's Energy Inventory.

How: Cost to implement this program is minimal. Potential costs are at the discretion of the City and dependant on chosen incentives. Examples of incentives include: offering greater density allowances, greater height allowances, greater maximum floor area allowances, a separate (online) permitting system for renewable energy, a separate permit program for energy efficiency and renewable systems in buildings, priority processing of permit applications, priority plan check, accelerated plans review, free services at construction site (water, electricity, etc.), unrelated incentives (gift packages, tickets to area attractions, etc.), design assistance, recognition for qualified projects (free promotional materials). Offering a suite of incentives for green building may require additional training or staff in the Building Inspections Department. The format for the online resource must be developed as well, which involves staff time.

Resources / Case Studies: A comprehensive suite of incentives offered at the local, state, and federal levels can be found here: http://www.dsireusa.org

Activity 2.2 Streetlight, Light Watchmen, and Parking Garage Lighting Retrofits

Who: The City is already making use of Light Emitting Diode (LED) streetlights in several pilot projects throughout town, and is discussing retrofitting municipal parking garages through a potential Phase II of the existing energy savings performance contract. City government and tax payers are already realizing savings from these initiatives. Through the continued cooperation of the Public Building Authority, the City Finance Department, Policy & Communications, Public Works Department, and Knoxville Utilities Board, tax payers will continue to pay less in utility bills, with the increase in capital being directed at more tangible services.

What: This activity recommends standardizing use of energy efficient lights by researching and developing a strategy for moving towards retrofits of existing and new City-owned streetlights, light watchmen, and parking facilities for conversion to LED, Induction, or other applicable energy efficient technologies. It involves developing new rate structures for the LED streetlights that are being installed in new and retrofit construction. It involves determining if LED, Induction, or other EE lighting technologies will be chosen for conversion. It involves potentially piloting LED light watchmen conversion to allow KUB to develop rate and maintenance structures.

When: Savings are already being realized through the Ameresco conversions. Converting to a newer lighting technology should reduce the amount and type of maintenance, and reduce the amount of electricity the City is

using. The cost of conversion of City streetlights can be developed once the new rate structure is set by Knoxville Utilities Board for the City. See pilot project proposal for cost of converting the City's light watchmen to LED.

Where: This activity involves City-owned parking facilities, light watchmen, and streetlights.

Why: The 2009 Energy Inventory identified the need to reduce energy consumption at all City facilities, and to improve the efficiency of traffic signals and streetlights. Converting existing mercury vapor, metal halide, and high and low pressure sodium to LED or Induction technologies will result in significant energy savings. Other cities who have converted have been realizing and average of between 30% and 50% reduction in electricity costs associated with streetlights. Methodically converting to a newer lighting technology should reduce the amount and type of maintenance, and reduce the amount of electricity the City is using. There is a need have a standardized rate, maintenance charging structure and adopted technology to move forward.

How: Existing contractual scope of work and operating budgets/staff time. Parking garage retrofits for energy efficient lighting are already completed under the Ameresco contract. Replacements of these lights are incorporated into normal operating budgets of the Public Building Authority and the City. As the replacements are already budgeted for, this is a matter of adjusting ordering preferences of department buyers, so when existing lights fail, they are replaced with a more energy efficient lighting technology (LED, Induction). A three-tiered cost estimate for conversion of light watchmen was presented to the City by utilities as a first step to agreeing on a new rate structure. At that point, the benefit-cost analysis was not favorable enough for the City to invest capital up front on a schedule that factors in the payback time.

If the City decides to convert to LED or Induction, the cost could stand alone or be converted into the City's existing Energy Savings Performance Contract, which already has a separate notice built in to proceed with streetlights. Internal coordination between City departments and KUB will be intense on the front end. Much work has already been done with the LED pilot on Wall Street, the development of the pilot program by Knoxville Utilities Board for the City's use, the new rate conversations, and the agreement between local utilities and City Engineering to use LED or similar technology moving forward.

The end result of this coordination could be a memorandum of agreement between KUB and the City to pilot the light watchmen, between the City and utilities to document the new rate, and between the City and a contractor to begin retrofits. It has been difficult for both the City and utilities to understand the impact of changing technologies on a large scale, but it has been helpful to start tackling the questions together.

The City and local utilities are closer than they have been, but much work still needs to be done to continue to move forward. With any large scale conversion proposal, the tax/rate payer must be protected. Research and caution are required to ensure that the decisions made are based on sound fact and that the new technology selected will be long lasting and energy efficient.

Resources/Case Studies: Knoxville's conversion of stoplights to LED has a 3-year payback period and is saving $250,000 annually. LED technology has advanced to allow for more effective heat dissipation, so it is reasonable to expect significant savings from this conversion effort as well. Knoxville Utilities Board has proposed a pilot to convert the 300+ City owned light watchmen to LED, which will help them develop a rate and maintenance charge structure. Though it was not cost effective enough for the City to engage at this point, Knox County Schools has decided to pursue light watchmen conversion, which will allow both Knoxville Utilities Board and the City to further explore options from that example. Huntington Beach, CA has done a full LED conversion and developed a new rate structure. The Wall Avenue LED streetlight test case has generated positive data, and an induction lighting pilot is going in on the University of Tennessee campus.

Activity 2.3 Revolving Loan Pilot for Residential Energy Retrofits

Who: This initiative proposes an alliance in a partnership of local stakeholders who create, oversee, and maintain a type of revolving low-interest loan fund for low to middle income home owners in Knoxville. These

funds would pay for weatherization and energy efficiency retrofits, potentially through utility bill financing. Key players include utilities, local government, lending institutions, community development agencies, and engaged non-profits.

What: Creation of an Energy Alliance to address weatherization funding would convene a broad set of community stakeholders to establish standards and conditions to which weatherization and retrofit contractors must comply to be eligible to bid on the work, including minorities and guaranteeing green building standards and training certifications. The alliance would also set target numbers of structures to weatherize and retrofit in a pilot phase and for the long-term, in conjunction with a stakeholder evaluation process.

When: In December 2009, the City and County applied together with Knoxville Utilities Board, Tennessee Valley Authority, and Southeast Community Capital for a Department of Energy Retrofit Program. While the funding was not awarded, that intensive exercise resulted in building the foundation of a partnership to address these opportunities as they arise. When a funding opportunity surfaces that can be used as a nest egg to buy down interest rates and seed the revolving loan, this partnership will be seasoned and ready to apply again as a team.

Where: The revolving loan would be housed in a financial institution. Residential energy efficiency loans are typically small, expensive to originate and service, relative to larger financing products. To date, national lenders have been hesitant to deliver attractive loan products to this small, but growing, residential market. In response, energy efficiency programs have found ways to partner with local and regional banks, credit unions, community development finance institutions and co-ops to deliver energy efficiency financing to homeowners.

Why: Buildings account for 70% of all U.S. electricity consumption and 40% of total U.S. green house gas emissions. So much of our existing building and housing stock is inefficient, wasting energy and income on unnecessarily high utility bills. It is estimated that half of the buildings that will be occupied in 30 years exist today. Cities with mature energy efficiency strategies typically include a program to retrofit existing local stocks of residential, commercial, and industrial buildings. Building retrofits can cut energy usage from 20% to 40%. Investments in building weatherization and energy efficiency retrofits are a very tangible and effective ways to lower energy bills, can pay for themselves over time with the energy they save, and produce local jobs.
Energy inefficient buildings make energy bills a particularly regressive burden on ratepayers. With more buildings in low and moderate income areas in relative disrepair, low-income families, on average, pay 16% of their income on utility bills, while the national average is 4-5%. The federally funded Weatherization Assistance Program targets homeowners whose household income is below 200% of the poverty level, for free home weatherization. WAP is managed locally by Knoxville-Knox County's Community Action Committee (CAC).

Even with an unprecedented spike in funding last year which allowed retrofit of 825 homes, CAC can weatherize only a small fraction of the low-income housing stock we have. In addition to almost 5,000 low-income owner-occupied households, there are about 10,000 owner-occupied units in Knox County classified as "moderate income" households. Many of these would have incomes above eligibility limits, but are unable to prioritize the out-of-pocket expense of retrofitting their homes. In 2010, the Knox County unemployment rate outside of the low and moderate income census tracts hovers around 8%, the unemployment rate within this zone is at 20%.

How: A revolving loan could be established by initial capital from public or private sources and would require a fund manager. This would have two components: 1.) a financial institution housed outside of the grant administration would manage the loans, and 2.) the grantee (City or County) would manage reporting for the grant and adhere to the terms and conditions of funding. While no upfront costs or down payments are required of the homeowner receiving the loan, they would be responsible for full payment under the terms and conditions of the loan, including lien placement upon nonpayment. Due to energy savings realized after the retrofits, the homeowner, all else being equal, could reasonably expect to see no increase in their utility payments, and possibly a small decrease, even after the loan payment is factored in.

Resources/Case Studies: Portland, Oregon's "Clean Energy Works Portland" highlights residential retrofits and job creation; Austin, Texas "Home Performance with Energy Star Program" highlights attractive financing mechanisms for residential retrofits through loan rate buy downs.

Activity 2.4 Measurement & Education: Energy Manager Position

Who: City Council, through the annual budget process, will vote on creation of this position. Through creation and management of the City's Energy Service Performance Contract, the City's Finance and Purchasing Departments have invested in energy efficiency to save money in the long-term. Facilities maintenance and operation staff will benefit from oversight and scheduled inspection and repair of existing facilities to ensure equipment is running at maximum efficiency. In order for the City to maintain operations in the face of rising energy and water rates, each person must do their part to keep utility cost as low as possible.

What: The City of Knoxville has an opportunity to improve the energy and water efficiency of its operations through creation of an Energy Manager position within the city government. This position would take responsibility for the City's energy usage and develop an energy management plan to provide cost effective energy and water utilization.

When: This should be established early to capture the energy savings of the other action items. The hiring of the Energy Manager could be implemented at once. It would likely take 8 to 12 months to develop the position's work plan, identify priorities, and implement strategies to reduce energy and water consumption. Cost and Green House Gas savings are likely within one year.

Where: The Energy Manager position would report to the Finance and Purchasing Departments of City government. Responsibilities would include:

- Reporting to maintenance staff on possibly unidentified maintenance needs to minimize waste
- Working with staff to evaluate and implement energy conservation projects, improve efficiency of equipment, and maintain facilities to optimize energy consumption
- Develop and implement energy conservation programs and training for City employees, develop long-range plans for meeting future energy needs and energy savings goals, monitor and report on the City's utility consumption
- Oversee documentation of utility metering, represent the City in its negotiations with Ameresco in conjunction with the Energy Services Contract Performance, implement and maintain computer system for billing measurement and utility trends to recognize problem areas and identify possible waste
- Perform periodic energy inspections; communicate with the City Council and Mayor's administration on energy- and water-related matters
- Identify and recommend additional energy and water saving opportunities, pursue outside funding opportunities for additional efficiency retrofits or initiatives
- Be the face of the City's energy and water reduction efforts, garner support for initiatives, and communicate benefits to the community

Why: This measure is intended to affect the energy and water consumption of all City-owned facilities. In 2005, the City's municipal buildings and facilities consumed 32.6 million kWh of electricity, 569/1 thousand therms of natural gas, and 85.8 million gallons of water. While the City's current energy savings performance contract (Ameresco) will reduce these numbers significantly, there is still an opportunity to achieve cost-effective energy and water demand reductions through the creation of an energy manager position within City government.

With the completion of the Ameresco contract and resulting retrofits, energy and water consumption among the City's facilities is expected to reduce significantly over 2005 levels. However, the City's energy and water use will not be as efficient as possible without assigned internal oversight. Accountability for energy and water consumption among City facilities will lead to the identification and implementation of cost-effective energy and water usage reduction opportunities. These opportunities will outweigh the cost to the City of funding and

staffing this position. Through measurable and identified energy and water reduction programs, the Energy Manager will reduce costs to the City even as energy rates increase.

Also, reducing energy and water consumption reduces the need to generate electricity, which in turn reduces the Green House Gas emissions related to electricity and water generation. While utility rates cannot be controlled, continuously reducing the City's energy and water footprint will result in the lowest possible total cost for City facilities. To that end, City departments have been asked to make every feasible effort to conserve energy and water. However, without a position established within City government to take ownership of this initiative, results will be limited and untracked. In addition to tracking savings from current efforts, the opportunity to identify and take advantage of additional cost effective energy savings opportunities exists through creation of this position.

Benefits include taxpayer money saved and Green House Gas reductions in the range of 250 - 450 tons of carbon dioxide equivalent, or approximately 3 to 5% of green house gases attributed to municipal buildings in the 2005 Energy Inventory. Ancillary benefits include the increased health benefits of reduced green house gas emissions as well as productivity benefits associated with a well-informed City staff that is committed to efficient government.

How: This will require a new operating line item in the Finance Department's annual budget. However, the position is expected to pay for itself within the first 2 years with 6 - 8 months of ramp up time. Initial cost would depend on the salary chosen for the position, typically $60,000 to $80,000 per year from national data. Ancillary costs to support this position would be minimal. In 2005, the City spent $3,700,000 on water and energy usage. It is likely that the Energy Manager, if provided with the proper support and authority, could reduce energy and water consumption within City facilities by 3% to 5% annually, leading to savings approaching $200,000.

The position should be filled with competent staff with a wide range of qualifications. Minimal qualifications may include: education in engineering, engineering technology, business, facilities management, strong verbal and written communication skills, computer literacy including modeling software, knowledge of energy awareness and training programs, grant writing experience, knowledge of building systems, and familiarity with utility rate structures, purchasing procedures, intergovernmental relations.

Resources/Case Studies: Most of the data from this proposal was pulled from the Knox County Schools Energy Manager position and the Asheville, North Carolina shared City and County Energy Manager Position.

8-10 Year Vision

With backing from the City Administration and City Council, one possible duty of the Energy Manager position may be to develop and propose a city-wide energy policy to maximize efficiency over the long-term. As noted, City Council action will be required to approve funding for the Energy Manager position. While a partnership is not required to move forward on this proposal, discussion with the County has indentified a potential opportunity for the City to partner with Knox County on a cost-share plan in the hiring of a joint City/County position.

Ultimately, an energy program that showed value in reducing overall City operating costs could potentially be expanded to include additional employees within the Finance Department, to implement further educational and training opportunities, increase the level of performance analysis, and to identify additional saving opportunities.

If a funding source for a pilot revolving loan program is captured and the program is successful in self-sustaining, an Energy Alliance could be formed from initial partners, with set goals, targets, and a formal level of organizational and managerial commitment beyond the life a the original grant. Portland's Energy Right program recently was incorporated at a state level, so there is potential for far reaching success if such a program is fostered.

Chapter 3: GOODS AND SERVICES ACTION PLAN

The City and County, together with Public Building Authority (PBA) and their partners, have made great strides towards operational improvements that consider the environmental, societal, and economics of landscaping, purchasing, and recycling. Many of the initatives outlined below are either already implemented or in the process of being implemented. Because this group had the largest scope, three subgroups were formed.

Goods and Services Group Focus

To explore green purchasing, sustainable landscaping, and event and park recycling options and to provide sustainable best practices recommendations to City of Knoxville Energy and Sustainability Taskforce.

Goods and Services Group Goals

To recommend to the Task Force an implementation strategy on three next steps from the Energy Inventory report:

- Aiding the Purchasing Department in honing and institutionalizing a green purchasing policy
- Developing waste diversion goals and exploring rollout of recycling in City buildings and parks
- Researching edible and native landscaping and community gardens in vacant lots, right of ways, and parks

Subgroup 1: Native and Edible Landscapes

Part of the Task Force's recommendations included adding native edible landscaping to City properties in order to provide more access to fresh foods and to serve as an educational model for homeowners. Currently, the City is working on creating an ordinance and licence agreement for 2011 on community gardens on public and private lands. It is also working on educational materials and a how-to guide for homeowners in support of community gardens, removal of non-native species, and an increase of edible landscaping.

Subgroup 2: Sustainable Purchasing

Part of the mission of the Goods and Services Work Group was to explore sustainable purchasing options and provide information on how to make informed choices. In efforts to educate City employees on sustainable best practices, a guide to sustainable purchasing has been completed by the Task Force, Knox County Solid Waste, and other contributing partners.

Subgroup 3: Recycling

In 2005, approximately 287,208 tons of waste was generated in Knoxville, or more than 18 times the estimated collective weight of all Knoxville citizens. Of this waste, only 6,333 tons were recycled. In order to decrease total waste and increase the proportion of recycled goods, various recycling initiatives have been implemented. In the City County building, single stream bins have been placed on every floor, and the collected material and weight is being monitored, with very positive results.

In 2010, two recycling pilot projects were in place throughout the City. The downtown pilot project collected tons of recycled waste from the 18 containers. The success of the collection and the participating demographic helped to make this program a reality. A pilot project in Caswell Park demonstrated the feasibility of recycling in City parks, with the plan being to increase recycling in large parks with high traffic volumes. In October 2011,

the City will begin service of a single stream curbside recycling as a tax-payer service to 20,000 hand-raising residents.

The City and County are also working on a variety of recycling programs. Encouraging electronic recycling in the community is a priority, and to the end the City and County have been working on a partnership with Goodwill to help establish a more convenient method for e-waste recycling. In addition to the above, the Goods and Services Work Group developed an educational guide for citizens on event recycling in public spaces. The City of Knoxville hosts unwanted medicines collection and used mercury thermometer exchange as part of household hazardous waste recycling initiatives. The purpose of these events is to prevent pharmaceutical and over the counter products from getting into the water supply, or into the hands of children, and to make sure they are disposed of in a safe manner. Theses initatives are part of the City's initiative to provide safe and accessible recycling for citizens.

Native and Edible Landscaping Recommended Activities

Activity 3.1 Edibles in Right-of-Ways and Public Locations

Who: City Public Service Department, Parks and Recreation, and Public Building Authority all deal with planting and maintenance in right of ways. City Public Service already plants some native species and edibles in right of ways, so this initiative will require order modifications when plant mortality requires replacement. Local groups such as Slow Food, Keep Knoxville Beautiful, and Edible Revolution have indicated interest in adopting different sites.

What: Edible landscaping allows for a form of urban agriculture, provides a teaching mechanism for good health and nutrition practices, provides an example of permaculture in action, and allows for a level of local food production available to anyone.

When: Already the City of Knoxville has utlized edible plants in right of ways. Growing the initiative would include enactment of a policy that allowed the entities who supervise City lands and right of ways to strategically think through locations and types of plantings to incorporate. This activity can continue to be implemented without a great budget burden as plants need to be replaced in the right of way.

Where: This initative involves City right of way, including embankments, medians, traffic circles, and along some sidewalks. Maps of edible landscaped areas could be made available online and at visitor's centers. Google maps are sometimes imbedded in cities websites showing food bearing plant locations, along with scheduled walking or driving tours to identify plant locations. Working with volunteers, an "Edible Knoxville" multi media feed could be utilized to notify followers when a certain variety of fruit is ripe, and link to the map showing plant locations.

Why: In recent years, demand for locally grown food has increased greatly. Having edibles in right of ways will benefit taxpayers, neighborhoods, tourists, people without access to fresh food, individuals in need of employment, and local businesses, especially nurseries and landscapers. This initiative encourages community engagement in sustainability efforts, water and energy savings to the city, beautification of city right-of-ways, increased food literacy, and the availability of local food to the public. Planting fruiting species will result in less fuel usage for lawn maintenance equipment by taking up yard space, less watering required once perennial plants are established, and a known yield of several pounds of fruit per mature plant will be available for public foraging. Increased beauty and utility of urban plantings can result in increased tourism and foot traffic. City water and lawn care maintenance costs can decrease if this initiative is implemented on a larger scale, by reducing the amount of land that requires mowing and active maintenance. Diversifying food sources in Knoxville's urban core will draw more people to the heart of Knoxville.

How: This initiative involves selection of appropriate sites, plant procurement, soil amendment, installation, and publicity. Ongoing maintenance includes pruning, mulching, occasional plant replacement, and an education

component concerning harvest and uses. There is no significant increase on cost over the life of the project: the cost difference between these types of planting versus typical ornamental right of way plants is negligible, and the labor and water for maintenance of perennial plants is significantly less than what is required by grass lawns. There is an opportunity for plant donation by local civic groups, businesses, and individuals, and the community has shown the capacity for volunteer participation in pruning and other maintenance activities. Schools, churches, civic groups, and individuals have shown interest in participating in harvesting activities. When plant orders are placed by the Public Service Department, there's an opportunity for local nurseries and landscaping firms to bid for contracts without increase of existing contract amounts. Issues that will need to be addressed through strategic locating include fruit and bird droppings, and trip and fall hazards. For this reason, fruiting plants should be located away from heavily used pedestrian or bicycle areas.

Resources/Case Studies: Portland Oregon, Davenport, Iowa, Seattle, Washington, and Milwaukee, Wisconsin all have programs that allow for thoughtful placement of appropriate edible and native plantings to suit individual locations.

Activity 3.2 Encourage Home Landscaping with Natives and Edibles

Who: Homeowners, neighborhood associations, people in need of fresh food, and local businesses. Local sustainability-oriented organizations or companies such as Slow Food, Keep Knoxville Beautiful, Edible Revolution, and the Knoxville Tree Board could help drive the program with local land owners in conjunction with the public right of way effort.

What: Educational materials made available to citizens should they require resources to help them plant, and perhaps participate in any harvesting or local food tour activities.

When: This initiative can be implemented with the release of a community garden how-to guide. A portion of allocated staff time could result in better coordination of public and private initiatives.

Where: Private land owners would be able to access educational materials and a network if they are intersted in participating.

Why: This initiative addresses encouragement of community engagement in sustainability efforts. It can empower individuals to play a part in their food supply and increase the productivity of the urban landscape, while reducing water and fuel spent on lawn upkeep. It reduces citizen dependence on imported foods. Long-term benefits include increased elimination of traditional lawns within neighborhoods and increased local nursery sales of fruit trees, berry bushes and native plants. It can also result in a rise in property values, community cohesiveness, and reduced health care costs due to healthier eating. Long-term, more tourism dollars will be spent as Knoxville becomes known as a fresh, local food destination and a more livable city.

How: As the guide becomes more widely circulated and used, next steps could be signage, local workshops, and door tags or mailers that direct to the appropriate website. Much like the community gardens program, participation and promotion among members of local sustainability-oriented groups will be key to the success of this venture. As with the community gardens initiative, a tool kit should be created and posted for homeowners to follow edible landscaping best practices, including site selection, choosing a plant variety, planting, maintenance, and harvest. Local stakeholders have indicated interest in edible landscaping workshops. Local businesses and organizations could be recruited to sponsor a program that provides trees to homeowners and organizes volunteers to help install trees and educate homeowners about maintenance and harvest. The average cost to a homeowner ranges from $8 to $50 per tree or bush, and roughly $40 in labor to install if the homeowner does not choose to plant it themselves. As with all personal property, the homeowner bears the cost of purchase and installation, possible theft of fruit from within property boundaries. Education is important so homeowners understand the best locations for fruit bearing trees, when to harvest, and expectations of avian waste on their property.

Resources/Case Studies: Nashville, Tennessee, Asheville, Noth Carolina, and some local homes in the Knoxville area who have successfully incorporated natives and edibles to eliminate lawn space and maintenance.

Activity 3.3 Community Gardens

Who: Involved City of Knoxville departments include Engineering, Law, Policy & Communications, Public Service, Community Development, and Parks and Recreation. Knox County, Food Policy Council, Knoxville Permaculture Guild, Beardsley Farm, local gardeners, and current community gardeners have been active stakeholders in this process. Knoxville-Knox County's Community Action Committee (CAC) will be the point of contact for anyone interested in starting a community garden. They will help identify parcels, understand insurance and permitting requirements, and help them pull together a permit application prior to sending the applicant to the City to start the permit process.

What: Establish a group of decision makers to work with local stakeholders in order to create an open process for participating in, helping out with, or establishing community gardens within the City of Knoxville, particularly on publicly owned lands and vacant lots. City officials are working with involved stakeholders to create a legal process that allows community access to shared garden space. Part of this process may involve creation of a registry or inventory of active or inactive gardens. Local experts have created a guide to explain the process to City residents. Stakeholders wishing to encourage community gardening can work together to identify educational materials that may be needed for aspiring community gardeners to develop valuable gardening skills.

When: Implemention has already begun, with development of an ordinance and license agreement, community garden how-to guide, process flow chart, and CAC's initial point of contact. All of this will be ready for kick off when the State Community Garden bill makes it through the legislature, enabling communities to create their own garden process.

Where: This initiative involves both public and private lands, but specifically lands owned by the City of Knoxville that are vacant and have been identified as fit under the established guidelines for community gardening. Private community gardens are only subject to the license agreement if they desire the privileges offered under the program, such as permits for water and storage amenities on lots with no existing structures.

Why: This initiative encourages community engagement in sustainability efforts. It exists at the request of the community, to make it easier for committed community members to establish community gardens, increase community gardens, reduce the number of blighted properties, increase community partnering and cohesiveness, and to make neighborhoods stronger and better. This step could be a beginning phase within a larger goal to create jobs through urban agriculture best practices. Communities with healthy gardens usually exhibit an increase in property values and community cohesiveness.

How: In the short-term a lot of groundwork was required, as issues of community gardens in the right of ways require working out several competing priorities that fall under multiple departments and jurisdictions. There are several committed stakeholder non-profit community organizations willing to advise, but development of a licence agreement and ordinance that successfully incorporates national best practices involves coordinating City Council and multiple City departments that will be impacted in workload and process by this work.

Once legal documents allowing the process have passed through City Council, administration will be necessary to review applications and approve permits. Maintenance of the gardens will be done by the permittee, including picking up litter around the perimeter, weeding and cutting grass, planting perennial flowers along the borders, maintaining plots through weeding and harvesting, and providing information for those new to gardening to be successful. City staff time for permitting, enforcement, education, and coordinating with stakeholders and CAC is spread among departments for this initative, and will be an onging necessity to ensure successful adminstration of the program. New work volumes requiring additional staff are not

anticipated, but depending on the amount of participation, an increase in education and promotion may result in an increased workload for city departments, stakeholders, and volunteers.

Resources/Case Studies: San Francisco, California runs their community garden from their Parks and Recreation Department, and there is a very successful vacant lot project in Albany, New York.

Sustainable Purchasing Recommended Activities

Activity 3.4 Employee Purchasing Guide

Who: The Goods and Services Work Group developed a green purchasing guide for City personnel, including buyers, employees that make purchases, administrative assistants, and department heads. The City's Purchasing Department is already leading by example through adoption of a Green Purchasing Policy, which the guide augments.

What: Informing City personnel can be achieved by creating a simple green purchasing guide. The guide will be distributed to employees that are authorized to make purchases. Creating a basic guide was a first step in procuring more sustainable goods and services. The guide was developed for employees in all City departments to purchase products that are environmentally and socially responsible. Employees can use the guide to compare sustainability labels or browse suppliers' green product lines. If implemented, awareness in all departments about sustainable products will increase, such as choosing recycled paper supplies or less toxic cleaners. The guide will need to be regularly updated, and an educational compent is necessary to encourage environmentally responsible purchasing in both the specifications for large contracts and day-to-day purchases.

When: This initiative is already in implementation. The Green Purchasing policy is adopted and the guide has been created and posted to applicable City websites. It requires upkeep to stay in current condition, and employee training is to be incorporated into annual and ongoing City Purchasing training.

Where: The guide lives on the City's Sustainability web page, and will be updated as necessary.

Why: Taxpayers can benefit through the reduction of purchased harmful materials and realize savings from sustainable purchasing practices. This initiative will work to reduce energy and water consumption at all city facilities, reduce the amount of waste generated by municipal operations and purchase of responsible products, reduce the fuel consumption, emissions, and maintenance of the city fleet, reduce the amount of waste sent to the landfill, and reduce, reuse, and recycle wherever possible. Sustainable procurement specifications in bids will also help to integrate sustainability objectives into economic development outreach and job creation initiatives, and encourage community engagement in sustainability efforts. The guide will provide information to and encourage purchasers and employees in all departments to purchase products that support environmental responsibility. It will help raise awareness in all departments of "green" products and products which are better for the environment than their counterparts. Environmentally preferable purchases include procuring products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. Sustainable purchases that are cheaper than unsustainable counterparts obviously result in greater fiscal responsibility. Taxpayers will receive greater quantitative health and environmental benefits as well.

How: Departments will be encouraged to revisit purchases they make to see if they can make their purchases more sustainable. Little change will be noticed from an administrative standpoint. Some studies have found fewer complaints from custodial employees using environmentally preferable products. By promoting low impact purchases, departments will encourage suppliers to continue suggesting environmentally preferable products. Additionally, low impact purchasing increases the marketplace for sale of these supplies. Because some of these products may be more expensive than less sensitive counterparts, purchasers will be encouraged to buy these products when it is cost neutral to do so. Departments are expected to manage their own annual operating budgets, and will continue to do so with this component in mind. All purchases will be made using

current procurement methods, with additional encouragement to use pre-approved vendors that have demonstrated a commitment to sustainable best practices. There is an education competent to explain why buyers who are used to using the same vendors should really examine the footprint of the product they are purchasing and switch brands if necessary. Purchasers will be asked to evaluate their decisions based on cost, product origin, quality, and common sense. Good stewardship is the driver behind this initiative.

Resources/Case Studies: Austin, Texas, Seattle, Washington, Portland, Oregon are all cities leading the way in sustainable purchasing. The Environmental Protection Agency has comprehensive and up to date green procurement advisory sites.

Activity 3.5 Integrating Green Purchasing: Procurement Personnel Training

Who: This initiative involves Purchasing personnel, vendors, department heads and administrative staff, and the support of the Administration. The Purchasing Department staff serves as the primary point for departments purchasing goods and services. Buyers, or professional procurement employees, assist departmental purchasers on every level from small transactions such as micro purchases to large multi-year goods and service contracts that are competitively awarded by solicitations based on departmental specifications. Their understanding of how they can influence sustainability through all stages of procurement is crucial. The Administration can increase emphasis throughout City departments on procuring items sustainably by noting an empahsis in manager meetings. Purchasing departmental staff can include this initiative in existing training with City departments, City purchase card holders, and staff purchasing a large amount of items based on departmental needs and budgets. This is a minor modification of existing personnel habits and does not require additional work load.

What: This initiative provides sustainability specific information and training to procurement and purchasing personnel and challenges them to integrate sustainability into their existing duties. Encouraging those making operational purchases to choose sustainable items, integrating training slides into existing purchasing training, and making this a reporting item will ensure its success. The goal is to be more aware of product origin, carbon footprint, and lifecycle from micro purchases all the way to checking specifications in bids. Green Purchasing does not have to be more expensive and can actually be more cost effective in many instances.

When: The Green Purchasing Guide is complete. Training for its use will be incorporated into ongoing and existing annual training conducted by Purchasing buyer staff for all departmental purchasers.

Where: Training will be conducted at the City County Building as it is currently.

Why: Encouraging City of Knoxville employees authorized to make purchases to procure sustainable items and make more sustainable purchasing decisions where reasonable can save taxpayer dollars and lead by example. Distribution of the green purchasing guide by senior City staff will give emphasis to this initiative, as implementation effectively requires administrative commitment. The Sustainable Purchasing Guide provides how-to and independent verification for making sustainable choices; distributing it and adding information to existing purchasing department training will incorporate sustainable purchasing into daily transactions without requiring much additional time. This initiative works to reduce the amount of waste generated by municipal operations. In some instances the taxpayer benefit may be less costly materials and overall reduction of toxins in the environment. For example, substituting environmentally friendly cleaning products for toxic cleaning chemicals reduces health risks. Fostering a healthy environment increases sustainable development and recruitment of green businesses to the Knoxville area.

How: Priorities are established from the top down by the Administration. Sustainable purchasing should be cost neutral. Labor to develop training or send personnel to training could vary in intensity. The guide must be posted, regularly updated, and distributed to individuals that make daily purchasing decisions. These individuals need to be encouraged to utilize the guide or other resources regularly in order to be effective. As the guide is improved with feedback it needs to be integrated into existing purchasing training, such as p-card

training, or new employee orientation. Commitment from the Administration is paramount in order to sustain a successful program to influence micro purchasing.

Without encouragement, reward, or requirement employees' buy-in will be limited to the individuals that are already committed to making more sustainable purchases. A sample questionnaire for buyers working with departments has been developed. This may lead to small changes in the existing policy but should more importantly address daily practices and procedures that augment the existing policy by integrating sustainability into bid/proposal specifications, economies of scale, local sourcing, women and disadvantaged owned business options. Another way to insure sustainable procurement is to add it as a departmental reporting item, as the City already does with the minority business usage.

Resources/Case Studies: Seattle, Washington has an extensive green purchasing policy which the City of Knoxville has utilized for its purchasing policy. Implementation practices vary.

Activity 3.6 Create a Sustainable Purchasing Staff Position

What: This initiative either hires staff or delegates a position that is responsible for overseeing or implementing sustainable purchasing procedures or policies. Administration is needed to ensure progress is tracked. This staff member should also be able to conduct ongoing employee education and training, as well as maintain a high level of researched authority on accurate labeling and product availability. Hiring someone to specifically increase sustainability in purchasing is reasonable since there are no staff members focused on sustainability inherently as part of their job duties in an already short-staffed department. If implemented, the City of Knoxville will institutionalize and make permanent the goal to increase sustainability by providing staff expertise to ensure sustainable practices in purchasing goods and services.

Who: Buyers, department heads, sustainability advisors, goods and service providers, and the community are all impacted by permanent availability of sustainabile purchasing oversight.

When: This action should be prioritized as the economy recovers and the City begins hiring again.

Where: This position could be housed in the Purchasing Department under direction of the Finance administration.

Why: The official purchasing policy must retain phrases such as "where reasonable" in order to satisfy legal frameworks. However, there are many situations where buyers could be in positions to integrate sustainable practices. Other policy recommendations attempt to address substantive short-term educational initiatives to affect purchasing habits, but these are low hanging fruit; education is a beginning. The suggestion of adding staff to encourage sustainability was warmly received by purchasing staff that were consulted. Asking an already maximized Purchasing Department to comply with another directive without staffing someone to assist would be less than optimal. Taxpayers will benefit in reduction in harmful materials and realized savings from sustainable practices. This iniative works to reduce energy, water, and fuel consumption, reduce waste sent to the landfill, and integrating sustainability objectives into economic development outreach and job creation initiatives.

How: Many institutions have employee-based Green Teams that serve as internal experts on such issues. An employee dialogue can facilitate ownership of the process. Long-term fundamental changes may require specific personnel tasked with increasing sustainability and modifying existing procurement practices; any such long-term changes will be difficult to accomplish with current staffing levels. The position should be requested as part of the existing budgetary process; additionally, grants could be sought to augment City investment in this capacity. Procurement personnel operate within mandated legal frameworks so the new or existing employee would have to understand possibilities and limitations associated with procurement systems and processes. Unfunded, unrealistic targets could demoralize existing purchasing staff, but the staff member responsible for increasing sustainable purchasing will track City purchases and be able to show progress.

Resources/Case Studies: Austin, Texas has a Green Procurement position that oversees procurement for efficiency and sustainability, and it has paid for itself many times over in the amount of resources saved through thoughtful purchasing. Seattle, Washington and Portland, Oregon also both have vigorous programs to increase sustainable purchasing with varying degree of reinforcement that include staff, ordinances, and vendor questionnaires.

Activity 3.7 Elimination of Unnecessary Disposables

Who: This activity impacts City employees, visitors to City offices, City taxpayers, and vendors that supply disposable items. It will require direction from City Council to City adminstration, buyers, and department heads. It is suggested that prior written approval be required in order to purchase disposable items where reusable ones can be substituted. Exemptions should be made where necessary for workers in the field.

What: Eliminating purchase of disposable items, such as Styrofoam, is key to leading by example and operating responsibly. If disposable items are necessary, then recyclable or more sustainable alternatives such as biodegradable items, paper instead of plastic, electronic instead of paper should be substituted. Disposable items include plastic water bottles, single serving food containers, cups, forks, plates, paper towels, water services, and Styrofoam. Post consumer Styrofoam is not recyclable and is one of the chief contaminates in recycling containers. Styrofoam does not break down in a landfill and takes up a lot of space.

When: This initiative does not require funding and can be implemented upon passage of a policy.

Where: Administrational directive or City Council ordinance to eliminate the purchase and use of unnecessary disposable material in City of Knoxville administrative and office settings and replace those items with reusable alternatives. If disposable items are necessary recyclable or lower impact items such as biodegradable items would be preferred.

Why: The City would realize immediate reduction of waste and cost savings from reduced procurement costs of disposable waste items. Facility recycling will receive less contamination. Taxpayer would realize savings from less wasteful practices and increased landfill life. This initative works to reduce the amount of waste generated by municipal operations sent to the landfill, to purchase environmentally responsible products, and to encourage community engagement in sustainability efforts. It will work to reduce disposable products shown to be prevelant in the City's waste audit. Very often disposable containers are not made of biodegradable material. A Styrofoam cup in the trash today can take up to 500 years to break down. It is a petroleum based product that cloggs our waterways and poses risk to wildlife. It is also hazardous to our own health, because when heated, it releases toxins.

How: An administrational directive or City Council ordinance would eliminate the purchase and use of unnecessary disposable material in City of Knoxville administrative and office settings unless absolutely necessary,and replace those items with reusable alternatives. Minimal cost is expected on the front end to replace disposables with reusable items. Offices that rely heavily on disposables will have existing products that should be used before re-ordering replacements, allowing a phased approach. Short-term expenses could be seen for each item replaced by reusable items. Cleaning reusable items could require more labor, energy, or water; however, Styrofoam, while cheaper in the short-term, has long-term lifecycle waste costs. Employees will be encouraged to bring reusable containers to work. Existing operational budgets should cover this adjustment in purchasing habits. No large purchase or changes in existing contracts will be expected. Notification to approved vendors and purchasing department buyers will be helpful.

Resources/Case Studies: Portland, Oregon had the first ban of Styrofoam that was enacted in the late eighties, and in following years close to 100 cities nationwide either have an ordinance in place or are currently working on one. Philadelphia and New York City are currently working on getting this ordinance passed as well.

Recycling Recommended Activities

Activity 3.8 Recycling Services Contractual Framework

Who: This activity effects the City of Knoxville, Knox County, Public Building Authority (PBA) and other interested departments or local governmental entities with cooperative purchasing ability, and impacts governmental properties and facilities.

What: Single Stream recycling is a process by which all recyclable material can be collected in one container and then picked up by a hauler and taken to a location to sort. This initaitive involves creating a contractual framework for municipalities to secure recycling services. Government agencies can solicit competitive pricing for recycling services needed at several types of facilities, providing an avenue for City of Knoxville, Knox County, PBA and other local governmental departments or entities to secure recycling services.

When: PBA has already implemented this into their procurement practices, making it easier for the City to borrow that language rather than recreating it.

Where: This activity is within the purview of the City's Purchasing Department, and will impact departments and facilities throughout the City.

Why: Having this contract in place will increase recycling through City of Knoxville, Knox County and PBA, and other interested governmental entities. Taxpayers will benefit from recycling savings. Cooperative purchasing language allows for municipal departments to share contracted services. Through PBA, City and County facilities now have guaranteed pricing for which they receive quotes and pay for recycling service at their facilities. Recycling service options can now be explored, departments can allocate within existing budgets for the service, and services may be legally procured more easily. This activity reduces the amount of waste sent to the landfill and leads by example. Offering single stream recycling increases participation and realizes the greatest diversion of recyclable material away from the landfill.

How: This activity requires development of specifications, advertising of competitive solicitation for pricing, and award of a contract. It invoves ensuring all facilities managers know about the contract once it is in place. Costs for recycling services could vary from one facility to another. Based on installation of recycling in the City County Building, there will be an immediate increase in collected recyclable material, but it will take longer to establish standards and consistency throughout the City of Knoxville and Knox County. Markets may need to be established locally or regionally to handle the increase in collected recyclable material. The goal is to have at minimum a cost neutral single stream recycling program. Savings are realized in reduced tipping fees and the recycling market is currently breaking even. Start up costs for users like recycling cans, toters or dumpsters as well as signs may require an initial expense. While often times there is grant funding for start up costs, operating funds are expected to handle the hauling service. The recycling commodity market is unstable and could cause the service to be paralyzed if the cost of hauling away the recycling material becomes a cost instead of neutral or a savings for operating budgets.

Resources/Case Studies: Knoxville's Public Building Authority has a cooperative recycling procurement contract in place, and they are willing to share it with other interested entities.

Activity 3.9 Downtown Permanent Recycling

Who: It's recommended that the City provide or contract for recycling bins for community use in the downtown area. Taxpayers benefit from increased recycling participation, longer landfill life, and lower waste costs. Downtown businesses, residents, recycling and waste companies, and tourists are all positively impacted by this initiative. City of Knoxville Public Service and Solid Waste Offices are the main points of contact. Receptacles will blend into the current downtown furnishing style and are compatible with vendor collection methods.

What: This recommendation includes the purchase or accepted donation of an initial set of bins provided by a sponsor, deployment, and ongoing service by the City of Knoxville Public Service Department or associated contractor. This initiative will increase the number of recycling receptacles, increase the ratio of recycling receptacles to trash receptacles, increase the estimated number of people who recycle, and increase the amount of material that is collected. This activity will require marketing to ensure collection levels remain high and residents as well as pedestrians are aware of the service.

When: In October 2011, existing pilot pedestrian recycling bins will be strategically repositioned to service residents as well as pedestrians. There are fiscal partnership opportunities with Knoxville's Central Business Improvement District (CBID) and the existing downtown funds to grow this approach. If funded in the future, pedestrian recycling bins could be added permanently to downtown.

Where: Receptacles should be centrally located and styled so as to be easily serviced by the City of Knoxville Public Service Department or its contractor. Downtown visitors or residents have opinions about recycling locations, frequency, bin appearance, and collection methods. In addition to intake of opinion through the available survey, education through a simple bin message and restrictive openings aids in keeping the containers and surrounding areas clean.

Why: In 2010, the City partnered with Waste Connections to run a pilot downtown recycling program. Because downtown residents utlized the bins more than pedestrians and tons were collected in months, the downtown area will have residential recycling pickup beginning in October 2011, which will increase recycling activity and work towards institutionalizing public recycling. The City will also divert more waste from the landfill, extending its life. This initiative works to reduce the amount of waste sent to the landfill and encourages community engagement in sustainability efforts. Recycling awareness and education is spread when everyone has the ability to recycle.

How: Existing bins will be repositioned to service residences as well as pedestrians, and will be cared for by the City's Public Works Department. If pedestrian recycling were to be institutionalized, permanent recycling bins run $200 - $400 each, and they typically require manual emptying of collected material. CBID or downtown funds may be available for infrastructure investment in order to offset the cost purchasing permanent bins. If the program was sponsored as the pilot was, long-term funding may not be needed in order to keep a roll-out recycling receptacle system. Investments in bins or recycling services would require a competitive solicitation subject to City purchasing rules. If receptacles fill up or if recyclables end up in the trash, observers will draw conclusions about the success or failure of the program. Therefore, contamination of recyclables can be an ongoing issue that needs continual supervision. Recycling myths are easily fueled when recyclables end up in the trash in public places. Complaints about aesthetics or about the size of the temporary containers were not an issue with the pilot project, but the community also understood that they were temporary.

Case Studies/Resources: The City of Knoxville conducted a pilot project with Waste Connections supplying 18 recycling bins in the downtown Market Square area. The program started in September 2010, and has diverted tons of recyclable waste from the landfill to date. A web survey provided information such as convenience and location, ease of use, appearance and design, and effectiveness of educational signs on the containers. The project was geared to pedestrian traffic and the majority of survey responders were in favor of continuing, expanding, and perfecting the program.

Raleigh, NC and Savannah, GA have downtown toters. Raleigh has a program that gives businesses window stickers so the public knows that they can recycle at those locations. Businesses benefit from increased foot traffic and the City benefits by having local businesses put out recyclable containers each day.

Activity 3.10 Recycling in City Parks

Who: City Parks and Recreation and Solid Waste Departments will be the lead and will continue to study feasibility to provide or contract for recycling bins in the City's larger and most used parks. Impacted parties

include park users, City employees, tourists, taxpayers, and local waste management companies. Labor needs include movement of recyclables to the larger staging containers for hauling.

What: Increasing the visibility and effectives of recycling can be accomplished by an expanded recycling program at the City of Knoxville Parks and Recreation facilities.

When: A pilot was conducted in 2010 at Caswell Park through AmeriCorps volunteer time and the cooperation of Public Service and Parks and Recreation Departments. Results showed waste reduction and cost savings. This program could be implemented as soon as a rollout plan has been developed and approved through the proper channels.

Where: Initially, properties for this program include staffed recreation and community centers located throughout the city, large parks, athletic fields and tennis courts where rentals and organized play occurs during playing season, as well as remaining outdoor seasonal pools.

Why: Taxpayers benefit from increased recycling participation through longer landfill life and the resulting lower waste disposal costs. This initiative will reduce waste going to the landfill from City parks, increase recycling, reuse materials, and increase visibility of recycling within the City. It will also provide an educational opportunity for park users to properly dispose of and recycle their waste materials and makes recycling more available to all residents of the City of Knoxville. The costs of waste disposal in Parks may decrease, allowing more efficient use of taxpayer money. City residents will be made more aware of recycling and waste reduction, which may lead residents to become more conscious about their waste. In addition to this, it may help reduce litter in our parks and will divert a large amount of waste from the landfill.

How: A formal cost estimate and rollout plan has not yet been developed and is needed to outline any future park-wide recycling program. Implementation will require a change in the process of how existing waste is handled in the parks. Public Service (Solid Waste, Horticulture) and Parks and Recreation have spent time formulating a list of parks that could support and warrant the costs of recycling. How material will be collected from the parks, how or if it needs to be consolidated to a central location, and how it will be transferred from that location to the recycling buyer are questions that the plan will address. Service costs could be up to $1,200 per park per year, and a benefit-cost analysis is necessary before proceeding through the budget process with this activity. From the Cansler Park pilot program, the charge was between $2 - $4/month for each 95-gallon cart supplied. City employees took collected material to an 8-cubic yard dumpster, and average monthly collected weight was tracked. The 8-cubic yard dumpster was between $80 - $100/month for pickup and rental. It cost between $5 - $8/toter per month, emptied once a week. Carts were grouped at a common curbside location by Parks and Recreation employees. Staging times were coordinated with truck routes and schedules. Purchase of recycling bins, signs, bags, and hauling fees for a permenant program will require initial capital and ongoing operating costs.

This program will require the purchase or the rental of bins and dumpsters for recyclable material. Additionally, it will require a contract for a waste hauling company. It may be logistically difficult to recycle within some parks due to the layout of the park, the size of the park, lack of oversight, or inability to transport materials to a centralized location for pickup. Smaller neighborhood parks and “pocket parks” would not meet criteria for recycling. Low volume or occasional use areas would not produce enough material to break even with the service, the material has a higher risk of contamination from non recyclable materials, and possible theft or damage of recycling bins is greater.

Case Studies/Resources: The City of Knoxville created a 6-month pilot recycling program within Caswell Park that lasted from June - November 2010. During the first three months of this pilot program, 1.41 tons of recyclable material was diverted from the landfill, the monthly waste hauling fees decreased by $48 dollars, and roughly 400 weekly and 600 weekend park users were provided the opportunity to recycle within the park. Through this program, it is estimated that 7 to 8 tons of recyclable material could be diverted from the landfill each year in Caswell Park, and that Parks and Recreation could save between $500 and $700 dollars per year. Other parks will have to be evaluated for specific details and volumes as to location size and use.

Activity 3.11 Event Recycling in Public Spaces

Who: Partners for this activity include the City of Knoxville Special Events Office, Public Building Authority (PBA), Knox County, Ijams Nature Center, event planners, promoters, recycling companies, and citzens attending the events.

What: This activity strives to provide comprehensive recycling and waste reduction guidelines for events within the City and County. Venues that are locally owned can support or possibly require low or zero event waste. Solid Waste and Recycling partners will develop an event recycling guide and toolkit for the purpose of further integrating waste reduction into events held on public property.

When: An event recycling guide and toolkit is being developed through coordination of Public Service and Special Events. A recycling trailer was purchased by Knox County for shared City and County special event use. A recycling trailer assistance program is in development, and coordination of roll-off is the next step.

Where: Any City or County venue hosting a public or private event will be eligible to receive the guide and use the trailer in order to engage recycling at the event.

Why: Providing comprehensive recycling and waste reduction guidelines for events within the Knoxville area is necessary to lead by example and set standards of community responsibility. Taxpayers would see higher recycling rates, less waste sent to landfills, and public awareness through education. The proposed activity would result in higher recycling. Energy Inventory categories that apply include reducing energy and water consumption at all city facilities, reducing the amount of waste generated by municipal operations, purchase of environmentally responsible products, reducing the amount of waste sent to the landfill, and encouraging community engagement in sustainability efforts.

How: The cost is minimal and absorbable in existing budgets and personnel roles. Some printing may be needed, but the equipment has already been purchased and resources have already been dedicated to this activity. Event permit stakeholders have been engaged. A guide is in development with local event recycling stakeholders. The guide will be adopted and encouraged by the venues available to event planners. If fully implemented, recycling at events would be strongly encouraged or even required, depending on the type of event and the space being used. There could be an event greening agreement integrated into the special events application, and a deposit required for use of recycling trailer and materials.

The guide for recycling at mid-size events (500-1,500 attendees) will need to be reviewed and updated on a regular basis. Events can advertise as being low or waste free, and the recycling trailer will be made available to solid waste partners for event recycling support. Refundable deposits may be utilized for use of equipment or for recycling services offered directly by venues. Purchase of additional trailers may be necessary at some point. While not a budgetary strain, this could mean increased responsibilities for the City's special events coordinators. PBA and volunteers will pull full recycling bins, and volunteers or other waste sponsors will haul away the recycling if a permanent recycling receptacle is not available. Labor resting on private event coordinators includes the set up, take down, and cleaning of bins. Possible obstacles include the decline of market for commodities, lack of additional trailers if multiple events are scheduled for the same day, lack of volunteers, possibility of recycling being contaminated, interrupted communication betweenPBA, event organizers, and other stakeholders, and non-compliance from vendors. To avoid possible hazards to volunteers, the trailer is equipped with gloves and hand sanitizer.

Case Studies / Resources: "Recycle Works" program, San Matio County, California; City of Eugene, Oregon Special Events Recycling Toolkit, City of Vacaville, California.

Activity 3.12 Recycling in the City and County Facilities

Who: The Public Building Authority has provided single stream recycling in City County Building. Partners in this initiative include the City of Knoxville, Knox County, and citizens frequenting the City County Building. Expanding this inititive to other municipal facilities will include continued partnership with the Public Building Authority (PBA), their custodial contractor, Sertoma contract labor, staff from City of Knoxville and Knox County Solid Waste Departments, and support from AmeriCorps personnel.

What: Providing single stream recycling at the City County Building was a multi-year and stakeholder project, and is currently operational. PBA is a full and willing partner with local government entities to make recycling as convenient as possible at the municipal facilities they manage. Targets for increased recycling at the City County building are 30% for year one and up to 50% by year three. In order to increase participation of the new simplified and expanded single stream recycling program, solid waste partners are using email and other internet capabilities to communicate goals and specifics of the plan. Solid waste partners are utilizing flyers to assist the PBA and promote recycling activities.

When: Purchase of a new compactor by the PBA in 2010 allowed implementation of a long-term effort to incorporate single stream recycling in the City County Building. Through cooperative procurement with the PBA, it is anticipated this initative will extend to all City owned facilities where the benefit-cost analysis aligns.

Where: Recycling is institutionalized in the City County Building, and the City is striving to spread this inititative to other municipally owned facilities - where logistically possible from a cost and service standpoint.

Why: Taxpayers are seeing higher recycling rates, less waste sent to landfills, and more public spaces offering recycling. By providing single stream recycling capabilities and making it as convenient as possible, we are leading by example and encouraging increased collection of recyclable material. This activity reduces local government's contribution to landfills, reduces the costs of landfill fees, and creates recycling habits in facility users.

How: The cost is being absorbed by PBA's existing budget. Use of update e-mails and signs keeps users up to date and motivated to meet goals. The cost to start a facility recyling program was between $5,000 and $10,000, dependent on number of containers and signs purchased. Payback period is believed to be 2-3 years with minimal participation. Current pricing through the cooperative procurement recycling contract is good through July 2013. Because instability in the commodities market can effect all costs and estimates, they should be revisited each time a new program begins in a different facility.

Resources/Case Studies: PBA implemented single stream recycling in the City County Building and information about the program is being provided to occupants in the building. This program was modeled after the City of Portland, Oregon and the City of Huston, Texas.

Activity 3.13 Electronic Waste Recycling

Who: The City, County, and Goodwill Incorporated have brochures, websites, and one-day collection events with media coverage. Existing partnerships between local government and trusted electronic recycling stakeholders like Goodwill and Dell can be strengthened to maximize collection. New partnerships can be added as alternative solutions are identified. Collection of electronic waste (e-waste) can happen at the City Transfer Station, Goodwill's private land, and City/County Super Recycling Centers. Building this program will require both a budget and staff time from the City and County to procure collection and processing services, manage contracts, and educate the community on services available.

What: This initiative is recommended to identify solutions to our community's disposal of e-waste, reduce the amount of e-waste sent to landfills in our region, identify options and alternatives, and educate consumers. The end product is creation of easily accessible drop off points in the City and County. Goodwill is already able to accept computers and peripherals through the Dell Reconnect program. No mechanism for the collection and

disposal of other e-waste has been identified to date. There would be a strong education component informing the community on the importance and need for e-waste recycling: on the products entire life cycle or series of stages that an electronic unit passes through during its existence.

When: Increasing resources for this program will require administrative initiative to capture more e-waste and can be examined with staff as soon as possible. Currently, almost all e-waste, or anything with a plug, goes directly to the landfill at the end of useful life. There are very few capable and responsible e-waste processors in the area. Transporting e-waste long distances is costly. Additionally, there is very little in terms of e-waste education, except for computer recycling. E-waste items are usually thrown away because they are cheaper to replace than to fix. There is no state ban on these items going to the landfill. Knoxville's solid waste and recycling stakeholders have messaging campaigns, websites, and one-day collection events that are advertised on television and radio.

Where: Utilizing existing City, County, and Goodwill Super Recycling centers can provide a place for disposal. These centers are capable of holding large amounts of waste, and the working relationships are already established. Goodwill is already capable of computer recycling through the Dell Reconnect program, so there is little risk in securing reliable, responsible program management.

Why: Taxpayers benefit from reduced amounts of harmful materials placed in landfills and increased disposal options. Recycling bulky electronics saves tipping fees, strengthens partnerships with nonprofits such as Goodwill, and strengthens local businesses by providing job opportunities. This initiative will help to reduce the amount of waste sent to the landfill, integrate sustainability objectives into economic development outreach and job creation initiatives, and encourage community engagement in sustainability efforts. Recycling more e-waste is recommended because the amount of e-waste is increasing. Recycling e-waste is important because toxic materials are transformed into valuable commodities instead of being dumped in landfills. Regional solid waste stakeholders should partner to identify opportunities to combine efforts by ensuring proper disposal of e-waste.

How: Contractual relationships and partnerships should be sought and fostered for collection and disposal of e-waste in addition to computers and peripherals, at a reasonable cost and convenience to citizens. E-waste is increasing, so the City may need budgetary increases for collection, disposal, and marketing of the service. A recent City and County request for proposals for the Transfer Station specifically mentioned the disposal of computers and TVs. Additional contract modifications that specifically cite disposal of other e-waste should be considered. The City's household hazardous waste and electronic waste contractor and the City and County's attended donation center contracts should be examined. Promotion of proper disposal and general educational information should be generated in conjunction with the contracts. Contracts should address the security of personal information on computers, hazardous material handling, beneficial end use, and compliance with all applicable local, state, and federal regulations.

Resources/Case Studies: In the past, University of Tennessee has partnered with Sims Recycling and Apple computers to hold e-waste events. The City of Austin, Texas also has a good partnership model with Goodwill Industries.

8 – 10 Year Vision

Long-term goals for the activities outlined in this chapter are closely linked to hiring procurement staff to drive and track purchasing sustainably over the long haul. For the long-term, assembling a group of departmental representatives engaged in the success of ensuring the City is sustainable in the realm of goods and services is paramount. Staff members should be engaged to discuss how services can be procured in more sustainable ways. Employee involvement will facilitate ownership of the process. Long-term operational changes will require specific staff tasked with increasing sustainability in procurement and basic operational practices.

Asking buyers to engage in sustainability dialogue with departmental purchasing staff will be most successful if buyers are not asked to bear much of the labor. For example, existing sustainability staff could handle a departmental questionnaire for each new good or service they procure. Asking other staff members to convene

regularly would cost time, but would foster better operational coordination within City departments. Hiring new or additional staff to facilitate sustainable purchasing will require operating funds. Properly defining sustainable purchasing concepts is needed to ensure no conflict with other existing benchmarks, epecially in relation to minority and women owned businesses, which support the social and economic growth pillars of sustainable business principles. This group would like to see the City have a strong and measurable procurement policy, and have made great strides towards being sustainable for the long haul in operations, purchases, and services rendered.

Chapter 4: INFRASTRUCTURE ACTION PLAN

The Infrastructure Working Group's recommends proposals for including sustainability into elements of street design, public parking facilities, and public park lands. Currently, efforts are being made to better coordinate utilities in right of ways (ROW), practice sustainable stormwater management through improved street design, recommend hardy native plants and stormwater friendly plantings in ROW, and to revise subdivision regulations for more sustainable development. The group's objective was to evaluate impacts of current City development and redevelopment practices, examine ways to improve current guidance for public and private development, and to research and recommend affordable and practical ways to incorporate sustainability into ROW and street design.

Infrastructure Group Energy Inventory Follow-up

The Infrastructure Group was charged with following up on these next steps identified in the 2009 Energy Inventory:

- Subdivision regulation revision: Requires Knoxville-Knox County Metropolitan Planning Commission (MPC) and Building Inspections staff time and City Council action, and is important to City Engineering
- Applicable native and stormwater friendly plantings in right of way
- Accommodation of multiple modes of transportation in right of way
- Better utility coordination in right of way
- Street design for stormwater best practices: a close look at local, collector, and arterial standards

Infrastructure Group Focus

The Infrastructure Group focused on working closely with applicable City departments to evaluate impacts of current City practices, and to research and recommend affordable, practical ways to incorporate sustainability goals into elements of street design, public parking facilities, and public park lands.

Infrastructure Group Goals

Within right of way and streetscape design, design and operation of parking facilities, and water consumption/irrigation for parks, the working group:

- Evaluated environmental and economic impacts of current practices
- Identified and prioritized most effective areas for improvements
- Analyzed and proposed strategic and viable methods for incorporating sustainable design and/or operation standards into engineering practices

Infrastructure Group Recommended Activities

Infrastructure Group recommendations for improved ROW design considered factors such as pavement width by street classification, pavement materials, on-site natural stormwater retention and filtration, drainage ways design and location, placement of sidewalks, bike lanes, landscaping, utilities, and regulation of design standards for future repairs and improvements. Of these areas, the work group evaluated environmental, social, and economic impacts of current practices, identified and prioritized most effective areas for improvements, and analyzed and proposed strategic and viable methods for incorporating sustainable design standards into engineering practices.

Activity 4.1 Subdivision Regulation Revision

Who: The City, the Knoxville-Knox County Metropolitan Planning Commission, area citizens, and developers are impacted by this initiative.

What: It is recommended that the City coordinate more closely with MPC and affected stakeholders to remove barriers to sustainable development in the zoning ordinance. The City can also encourage new sustainable development by modifying the subdivision regulations to consider reduced pavement widths by street classification, reduced pavement sealing requirements, and modification of curb requirements to aid in drainage design, filtration, and retention in preparation for new stormwater regulations.

When: This process has begun with collection of City Engineering's comments to MPC on the subdivision and zoning regulations, and requires assignment to MPC staff and coordination with City Engineering and Policy & Communications.

Where: All lands within the jurisdiction of the City. MPC, City Engineering, and City Policy & Communications Departments will work together on a package that can be vetted by stakeholders prior to adoption.

Why: Modifying existing subdivision regulations will benefit the taxpayer by allowing development to go in at a reduced cost. Construction budgets will benefit from removal of current requirements such as pavement sealing and reduction in lane widths. This and other relaxed requirements will work to reduce the costs that developers pass on to the home buyer. Smaller streets and less-engineered drainage systems can save taxpayers money on future repairs. Water quality improvements and air pollution reductions save City and taxpayer fines and loss of funding due to non-attainment. Finally, cleaner runoff increases the overall health of our region and allows us to be good neighbors to the communities downstream.

How: To ensure the quality and quantity of local water supplies, City Engineering and MPC have been working on suggested revisions for several years now, so it is important they make it into the code and become a part of Knoxville's zoning requirements to prepare for new Environmental Protection Agency stormwater regulations. The objective is to get to a measurable indicator tied directly to this goal, and to have streetscape design and new development that shows thoughtful consideration to water quality, various transportation modes, and creation of a sustainable built environment. This involves coordination with the City and MPC to ensure the subdivision regulations are modified to the benefit of both parties and for the taxpayer. MPC is interested in sustainable growth in our Metropolitan Statistical Area, and City Engineering is concerned with meeting new federal stormwater requirements. After the initial process of modifying subdivision regulations to ensure sustainable infrastructure, growth is encouraged and not prohibited and our community has the chance to grow in a responsible manner. This will need to be addressed between MPC and the City's Policy & Communications Departments during budget planning. The City should request an audit and revision to be budgeted by MPC for their fiscal year's work load. Cost involves staff time for both the City and MPC. It is recommended the City earmark annually a portion of the funds provided to MPC for updating existing zoning regulations. Each year, this request can be repeated, so the City has a working code that is compatible with current technology and national trends. The results and next steps of this annual code audit request should be reported annually by MPC to the City.

Resources/Case Studies: This needs to be treated with sensitivity and consistently involve good research, good case studies, good communication, and the capacity of a community member to follow the process from start to finish. As with any major policy change involving development, a transparent vetting process must be followed. Nashville, Tennessee has completed this process and would be a good case study.

Activity 4.2 Plantings in Right of Way

Who: This activity involves the City's Public Service and Engineering Departments, as well as local developers, design consultants, community members, and utilities.

What: Policy & Communications will work with Public Service and City Engineering to embed a planting policy in the Land Development Manual and post an online guideline to plantings acceptable to the City of Knoxville in the right of way. Plantings should reflect common sense in light of a variety of competing needs for ROW space. Grass width and planting standards should be chosen to provide good filtration and stormwater retention in preparation for new stormwater regulations, be sensitive to reducing mowing and maintenance requirements, and continue to accommodate space for pedestrians, parking as needed, and utilities.

When: Guidelines could be issued in conjunction with the City's Tree Inventory Report. City Engineering, through professional service contracts, is regularly presented with planting schedules in right of way that are currently not vetted for appropriate use of native species, heartiness, and retention capacity prior to submission. A list of planting guidelines on applicable City web pages will aid consultants in designing right of way for the City, in plant selection, and in recommending appropriate supporting environments. In addition, standards should include planting requirements that ensure coordination with underground and overhead utilities, reminding contractors that Tennessee One Call request is required before digging, and that appropriate-height trees must be planted at an appropriate distance from power lines.

Where: On City owned public right of way and lands, utilize streetscape design that shows thoughtful input with consideration to water quality and a sustainable built environment. Develop a planting schedule that lives online and reflects the City's guidelines and tolerance for plantings and their environments, perhaps in conjunction with Knoxville's 2011 tree inventory results.

Why: The tax payer will benefit from appropriate species selections and successful supporting infrastructure by paying less in tree replacement and less in mowing costs. Filtering stormwater runoff will contribute to cleaner local water supplies, which ties into the Energy Inventory's goal to ensure the quality and quantity of local water supplies.

How: To achieve successfully vegetated streetscapes and public spaces in Knoxville, the development and vetting of a list that's acceptable to City Public Service and Engineering that works within local substrate and climate constraints and reduces the need for a watering schedule should be coordinated by affected departments. Costs of this type of planting schedule will be reflected in individual capital project budgets. Short-term labor needs include creating a list of native species that will thrive in built environments in Knoxville and be acceptable from a maintenance and watering schedule standpoint. Capital projects that plan for any kind of landscaping will utilize this list in their planting schedules. Redevelopment/development projects that are public are bid through the City's Purchasing website. City Engineering works with local consultants to develop a list of standards that are incorporated into individual project plans. Plantings need to be coordinated with the location of underground and overhead utility services.

Resources/Case Studies: Nashville and Chattanooga, Tennessee have examples of successful plantings and designed planting areas. Ashville, North Carolina also has examples, but elevation should be considered if these types of plants are considered locally.

Activity 4.3 Accommodation of Various Modes of Transportation in Right of Way

Who: City Engineering and MPC have been working on adding bike lanes and sidewalks on a project by project basis. Encouraging developers to plan for the bikers and pedestrians on the front end will result in a connected community, which aids commuting options and helps in business recruitment and retention. This activity impacts KUB, the Chamber of Commerce, developers, design consultants, and community members.

What: Options for commuting are an important part of the national ranking process that many businesses make relocation decisions from. During streetscape design, resurfacing, and development processes, planning for bike lanes (where the connection is important and when right of way allows), and sidewalks (where they make sense) will enable Knoxville to encourage residents to use alternative means of getting around for recreation and work. Making additional traffic modes a part of the streetscape design process will include

evaluation of bike lanes striped in ROW where feasible and possibly requesting sidewalks of developers where it makes sense to do so from an interconnectivity standpoint.

When: Current capital projects in design are already undergoing this process. Future new or redevelopment capital projects will also be subject to these types of evaluation.

Where: This activity impacts City of Knoxville right of way.

Why: Transportation options and a well connected City can reduce traffic congestion, can increase air quality, decrease obesity levels, and improve general health and quality of life. It applies to reducing transportation-related fuel consumption and emissions and encouraging community engagement in sustainability efforts.

How: This activity can be implemented by adding language in the Development Manual and Land Use Regulations to specify a preference for these amenities when right of way space and budget allows. Ensuring that bike lanes and sidewalks are looked for during the plans review process, and, if not practical or possible, the reasons why are documented will provide accountability for this measure. Capital project budgets will allow for the types and kinds of amenities in each specific instance. Acquiring right of way may not be an option if the budget is tight, landowner issues may be sensitive, and topography may not allow for additional transportation modes in some instances. Design of City capital projects are bid through the City's procurement process. On the front end, appropriate language to allow for this type of consideration needs to be incorporated into appropriate bid specifications and into the Land Development Manual. On the back end, this activity requires evaluation on a project by project basis. Project budgets, existing right of way, and utility placement are the main constraints to placement of bike lanes and sidewalks. Sidewalks and bike lanes need maintenance, so they have an ongoing cost to ensure the City is not sued for failure to maintain. Sidewalk maintenance is costly, and there are existing processes in place to evaluate needs against annual budgets.

Resources/Case Studies: Nashville, Tennessee has updated many of its codes and ordinances to allow for sustainable best practices, and could be a resource for the City as it undertakes many of the initiatives in this chapter.

Activity 4.4 Utility Coordination in Right of Way

Who: City of Knoxville Engineering, area utilities, developers, design consultants, taxpayers are all affected by the clarity of utility coordination during the design and construction process.

What: Develop a process to simplify the decision making process. Develop a coordination plan for KUB utilities and City Engineering that's transparent, respectful of the needs of both parties, and documented to expedite plans review. Better coordination of affected stakeholders is needed during the design process to find suitable locations for utilities that minimize pavement and root disturbance and maximize ease of maintenance for utility work crews.

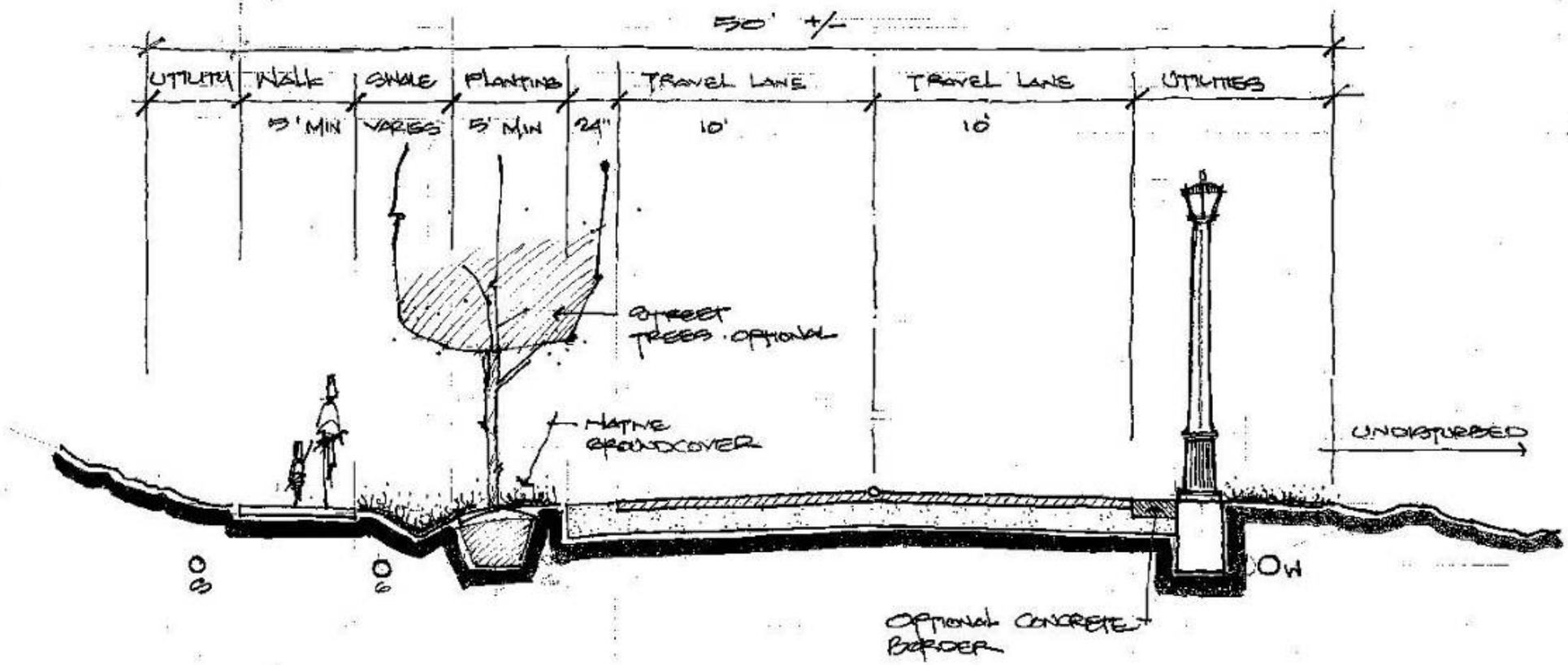
When: This activity impacts the design phase of existing and new construction.

Where: This activity deals with City of Knoxville right of way and utility easements in new construction or redevelopment capital projects, when they begin design.

Why: City Engineering and local utilities coordinate utility placement on a project by project basis. This process can be tenacious and challenging due to existing infrastructure, cost sharing, and competing needs for limited ROW space. Streamlining coordination with the design consultant, City Engineering, and local utilities will result in fewer change orders and schedule over runs, which will save the taxpayer funds that could go to essential services. Good coordination in ROW works to ensure the quality and quantity of local water supplies and encourage community engagement in sustainability efforts.

How: Streamlining communication requires staff time and commitment to research the most effective way to coordinate environmental and site evaluation work between agencies, place utilities to maximize ease of maintenance and reduce surface damage to repair, and standardize preferred materials (lighting, back fill, etc.) between coordinating agencies. This could be handled by adding language in the Development Manual and Land Use Regulations to specify City and local utility material preferences and location of gas, water, electric, cable and phone, stormwater, and sewer placement. This could work to ensure that during the plans review and construction processes, coordination is smooth and timely. Design of City capital projects are bid through the City's existing procurement process and should involve utilities on the front end. Project schedules and budgets cannot be maintained without timely and cooperative coordination. Utilities require maintenance, so they have an ongoing cost on the back end to ensure the City or utility is not sued for failure to maintain. Maintenance in the ROW is costly and can result in a patchwork effect if not properly coordinated from cradle to grave.

Resources/Case Studies: The Infrastructure Work Group provided drawings for local, collector, and arterial streets as follows. These drawings are meant to be a starting point for discussions in the engineering of new streets and the refurbishing of old street sections. Please note these drawings were an attempt to begin the cohesion of ideas on paper and are not adopted standards. Actual standards would not contain side paths for safety considerations, and utility easement sizes would differ, for example.



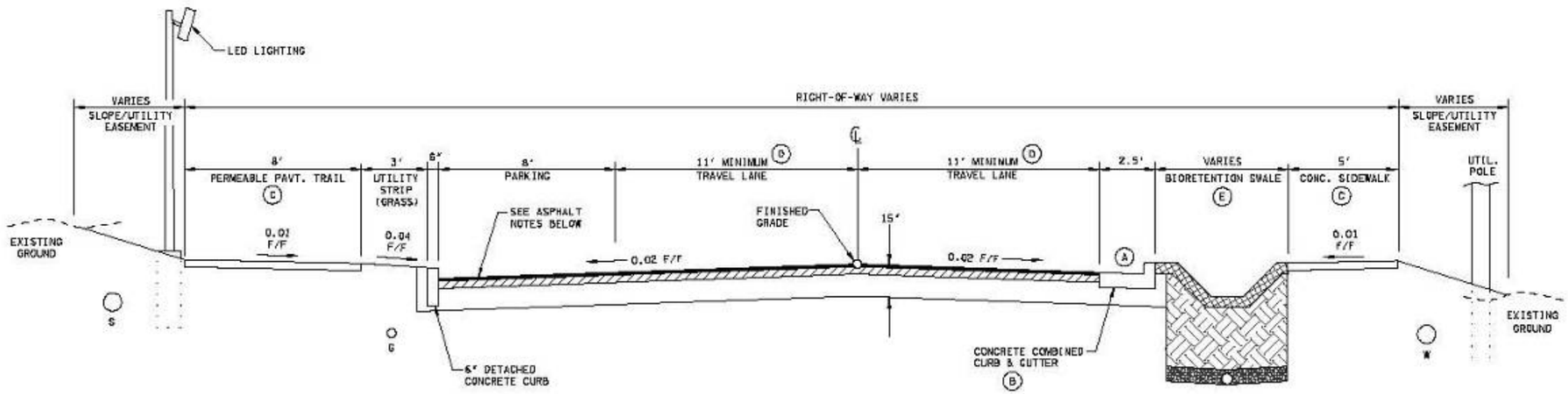
Drawing courtesy of Benefield Richters

Group Notes on Local Street Drawing:

1. Utilities: Roadway design and construction should be coordinated with utilities to minimize conflicts between utility mains/conduits/poles/service lines and the new proposed drainage and planting standards. In particular, utilities should be consulted with regard to easement width and location and contractors should be instructed in proper planting methods (including selecting the right trees and planting them away from underground or overhead utility lines).

2. Trees: The locations of street trees must be coordinated with the street lights, utility poles, and underground utilities.

3. Drainage from the swale: The water can be handled any of several different ways depending on site and project. In some cases, it will go into on-site detention; other times, a swale may not be needed at all and it might sheet flow instead. In any event, this concept would almost never need a storm sewer for overflow. Swales carry a lot of water and can be sized accordingly, though runoff might eventually end up in a storm sewer downstream in high rainfall events.



TYPICAL RIGHT-OF-WAY SECTION
URBAN COLLECTOR ROADS

FOOTNOTES

(A) SPACED CURB CUTS WILL ALLOW STORMWATER TO FLOW TO THE BIORETENTION SWALE. THIS ELIMINATES THE NEED FOR CURB INLETS AND IRRIGATION. OVERFLOW SYSTEMS MAY BE UTILIZED INSIDE THE SWALE IF ADEQUATE STORAGE VOLUME IS NOT FEASIBLE WITHIN THE RIGHT-OF-WAY.

(B) IF DETACHED 6" CURB IS USED ADJACENT TO A TRAVEL LANE (IN PLACE OF CURB & GUTTER), THEN THE WHITE EDGE OF LANE LINE SHOULD BE INSTALLED 1'-2' FROM THE FACE OF CURB.

(C) THE PERMEABLE PAVEMENT TRAIL AND CONCRETE SIDEWALK WILL REQUIRE A BASE LAYER.

(D) 10' TRAVEL LANE IS ALLOWABLE IF ADT < 400 VEHICLES PER DAY.

(E) PLANT MATERIALS FOR THE BIORETENTION SWALE WILL COME FROM THE C.O.K. APPROVED PLANTING LIST.

ASPHALT NOTES

THE U.S. GREEN BUILDING COUNCIL RECOGNIZES THREE METHODS OF LEED CREDIT FOR ASPHALT PAVING.

1. POROUS ASPHALT PAVEMENT (PERVIOUS PAVING)
2. LIGHT-COLORED AGGREGATE OR ASPHALT SEALANT TO REDUCE THE HEAT ISLAND EFFECT
3. USING RECYCLED MATERIALS IN SURFACE COURSE (15%) AND INTERMEDIATE COURSES (25%)

Drawing courtesy of
Cannon and Cannon, Inc.

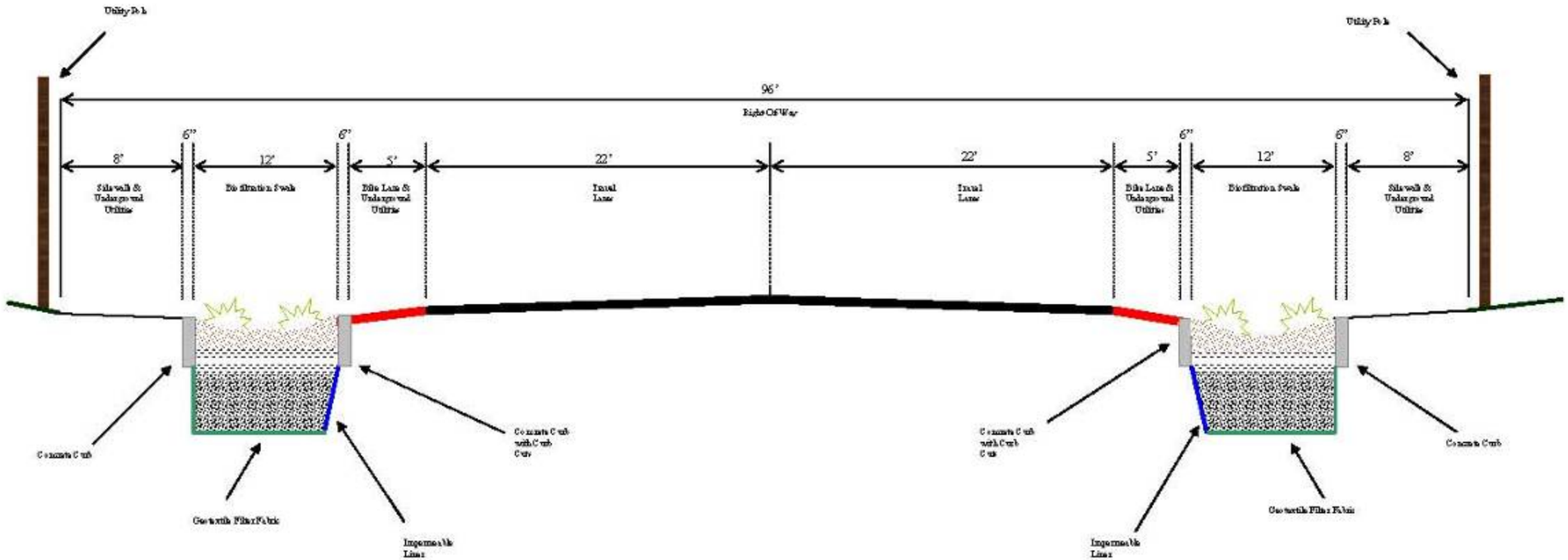
CITY OF KNOXVILLE
SUSTAINABILITY TASK FORCE

TYPICAL RIGHT-OF-WAY SECTION
COLLECTOR ROADS

Group Notes on Collector Street Drawing:

1. Utilities: The location and utility easement sizes shown are for example only (gas service is typically 5'). Utilities are further impacted by the location of any bio-retention swales on the roadside. Any underground service locations (gas, water, wastewater and underground electric) must factor in the ability to serve both sides of the street, which will at a minimum requires enough ROW to allow for deeper pipe/conduit. This is especially critical for sewer, since the wastewater coming into the pipe flows by gravity, meaning wastewater pipes must be located at a lower depth than the service lines connecting to them. Local utilities prefer that as much as possible be located outside the roadway to minimize pavement disruption for maintenance and repairs. However, the design of the drainage system can impact this considerably and might even lead to a design solution that moves utilities back under the pavement (in cases where the alternative would be to locate services either extremely deep or on both sides of the street to minimize issues with service lines crossing the roadway.
2. Water: Stormwater flowing to the non-swale side of street get is piped to swale drain at periodic intervals.
3. Curb and Gutter: The Group identified several existing collectors and arterials without curb & gutter. While it is difficult to define when curb and gutter is appropriate to leave off, curb can be optional, depending on zoning and site conditions.

Typical Right-Of-Way Section
4-Lane Arterial



Drawing courtesy of the City's Engineering Department

Group Notes on Arterial Street Drawing:

1. Consider reduced pavement width at every opportunity
2. Consider reducing curb requirements through updated development criteria
3. Consider grass strips
4. Consider additional modes of transportation
5. Consider LEED neighborhood design guidelines during development manual updates
6. Consider utilities and tree locations in tandem
7. Consider maintenance needs when forming recommendations
8. 2011 Tree Inventory being conducted through the Public Service Dept. will provide more planting guidance than previously available

8 – 10 Year Vision

The contents of this chapter are about evaluating the impacts of the way we do things now compared to where we are headed as a community and a nation. Long-term, the City would like to have a sustainable infrastructure plan similar in content to Nashville's Green Infrastructure Master Plan. A comprehesive look at how we do things and why and a product that serves as a guiding document will serve the City, taxpayers, and design consultants well.

Thoughtful and consistent guidance and timely feedback to proposed construction will save confusion and change orders on the front end, during the design process. Good coordination and consistent practices both in design review and construction materials between agencies such as the City and the Knoxville Utilities Board will save money by reducing confusion and change orders during the construction process. Consistent use of locations, practices and materials allows for a streamlining between agencies during the maintenance process. The City is committed to operating best practices, and by striving for flexibility and innovation to achieve that end, on time, and within budget, we achieve good return on taxpayer investment.

Chapter 5: SUSTAINABLE GROWTH ACTION PLAN

The City has been moving towards incentivizing and requiring commercial and residential contractors to incorporate and foster sustainable best practices into new construction and redevelopment. These efforts are best seen with the adoption of form based codes in the South Waterfront and Cumberland Avenue redevelopment districts, which encourage developers to create energy efficient and environmentally friendly development projects. In addition to using new types of zoning, the City's Community Development Department has made a concerted effort to capture energy certifications with the grant funds they put into stressed communities. Some affordable housing has been Leadership in Energy Efficiency Design (LEED) Gold Certified, and some has been Energy Star Certified. The City has applied to have both the Transit and Convention Centers LEED certified.

Additionally, partnerships with organizations such as the Knoxville-Knox County Community Action Committee (CAC), Knoxville-Knox County Metropolitan Planning Commission (MPC), Knox County Health Department, Homebuilders Association, and Knox Housing Partnership have allowed the City to leverage grant funds and reach the community through existing channels. On the strength of partnerships like these, the City of Knoxville was awarded $4,300,000 of the federal Sustainable Communities Regional Planning Grant, to help make East Tennessee more sustainable (PlanET). The funds from this grant will help achieve some of the activities outlined in the goals of the Task Force's Community Involvement, Infrastructure, Sustainable Growth, and Transportation Working Groups. Goals of that grant include planning for sustainable development.

Sustainable Growth Group Energy Inventory Follow up

The Sustainable Growth Group was charged with following up on these next steps identified in the 2009 Energy Inventory:

- Initiating stormwater best practices instead of waiting for the regulation to dictate action
- Building code modification to encourage green development
- MPC and City budgetary planning to ensure better coordination between funders and deliverables and capitalize on current momentum of PlanET
- MPC Sustainable Zoning Code Changes

Sustainable Growth Group Focus

The Sustainable Growth Group focused on making building codes, community planning, and residential and commercial design and development more energy efficient and environmentally friendly.

Sustainable Growth Group Goals

In order of priority, the group focused on developing recommendations to help the City:

- Transition to updated building energy codes
- Adopt Engineering's suggestions for Sustainable Code Changes
- Consider ways to maximize effectiveness of resources in City planning
- Identify and recommend potential amended Green Building Policy for municipal buildings
- Evaluate incentives for energy-efficient/sustainable private sector development
- Maintain and expand support for Community Development's responsible and energy-efficient rehabilitation and construction goals

Sustainable Growth Recommended Activities

Activity 5.1 Knoxville-Knox County Metropolitan Planning Commission-City Interaction Policy Proposal

Who: Coordinating organizations and departments during an integrated budget planning process will take staff commitment from MPC and impacted City of Knoxville departments.

What: This activity suggests alignment of MPC and City of Knoxville goals, especially during annual budget planning and the evolution of plans development and code audits. It strives to create a direct link between the annual budget process and MPC's work plan, thereby ensuring the plans MPC develops are supported by long-term capital budget intentions. Ideally, fostering and streamlining communications will remove disconnect between the planning process and funded capital projects, which will manage expectations of both staff and community members alike.

When: This policy is to enhance existing coordination efforts and allow for existing City and MPC staff to work more effectively together, especially during budget planning.

Where: Public and private lands alike are affected by comprehensive plans and code changes.

Why: This activity works on the Energy Inventory goals to reduce transportation-related fuel consumption and emissions, improve the energy efficiency of local homes and buildings, and ensure the quality and quantity of local water supplies. Cohesion between publicly vetted plans and publicly funded projects will decrease short-term, unfunded projects by integrating City capital funding into metropolitan planning efforts.

How: Single points of contact need to be identified and tasked with integrating MPC proposed planning projects into the City's budgeting process. Working with MPC to overcome current fiscal concerns such as staffing needs versus budget allocations and targeting key initiatives will help both agencies prioritize. Working with MPC in this capacity will help plans come to life, slowly overcoming the sense of "planning without implementation" that currently exists in some sectors of the community. Factors that need ongoing evaluation are the annual increase in the cost of living for MPC staff and City project planning needs. City review of the existing MPC charter is needed to better understand what percent of their work is funded by the City and how much work load can be coordinated with MPC's state and county obligations.

Resources/Case Studies: The MPC charter and historic City budget allocations to MPC's need to be evaluated to form a solid foundation to make decisions on how coordination needs to happen moving forward.

Activity 5.2 Knoxville-Knox County Metropolitan Planning Commission Sustainable Code Policy Proposal

Who: Affected stakeholders for this activity include the City of Knoxville's Engineering, Community Development, and Building Inspections Departments, Knox County Health Department, U.S. Green Building Council, Food Policy Council, Homebuilders Association, Community Groups such as Slow Foods and the Farmers Market, commercial contractors, Knoxville-Knox County Community Action Committee, East Tennessee Quality Growth, and MPC.

What: This activity involves adoption of Zoning Code Changes that Better Promote Sustainable Practices, as identified through the MPC's code analysis chartered by the Active Living & Healthy Eating Initiative and the findings of PlanET in the coming years. Leverage institutional requirements to promote sustainability by removing barriers to sustainable practices and strengthening existing language can motivate positive action in our building community.

When: City Engineering has requested code changes to begin incorporation now. Additionally, formal adoption of code changes suggested by MPC at the completion of the Active Living & Healthy Eating code analysis and those changes identified by the evaluation under PlanET should be formally adopted as they are completed.

Where: Public and private lands alike will be affected by code and regulation audits and improvements.

Why: Evaluating and changing codes to match sustainable goals works towards reducing transportation-related fuel consumption and emissions, improve the energy efficiency of local homes and buildings, ensuring the quality and quantity of local water supplies, and increasing ability to pursue sustainable practices and reduce barriers to this end. Anticipated results are a healthier, more connected, and sustainable urban environment. Actions allow greater ability for community groups currently working on projects such as community gardens, edible landscapes, and other sustainable efforts to follow through on plans without violating code or requiring variances. A sustainable community has current infrastructure and plans for active, healthy living and a healthy environment.

How: MPC is currently working on a comprehensive analysis of the Knoxville-Knox County Zoning Code to identify codes that impact the ability of the community to walk, exercise, eat local foods, and otherwise engage in activities associated with Active Living and Healthy Eating. It is suggested that the City adopt code changes recommended by the study, as well as those recommended upon completion of data collection for the PlanET effort. While there is no direct cost associated with implementing policy change, specific code changes may result in some increased cost of maintenance born by public and private sectors. Cost will be better estimated when the code studies are complete. Annual appropriations should be designated as part of MPC's budget each year to evaluate the subdivision regulations and zoning ordinances and to ensure the currency and applicability to overall sustainable goals. MPC and City Council approval will be needed for any changes to the code. MPC needs to be able to staff annual reviews and as it's been so long since codes have been updated, the initial effort will be intense. Continued City, county, and grant funded financial support will be required for this effort, whether it's consulting or existing MPC staff time. As always, code changes require a somewhat intensive process and can be controversial at times. It is imperative the public process be handled carefully to ensure stakeholder support.

Resources/Case Studies: Atlanta, Georgia and Fowler, Colorado have both been through major code overhauls that involved evaluation and modification to achieve sustainability goals.

Activity 5.3 Stormwater Utility Policy Proposal

Who: City of Knoxville citizens and City Stormwater Engineering are both affected by this measure.

What: This activity involves consideration and appropriate adoption of impact fees in the form of a Stormwater Utility to finance upgrades to the existing system. It will require a team to determine the steps necessary to establish Stormwater Utility by coordinating with the City's Law, Engineering, and Finance Departments and the Knoxville Utilities Board. Finance has been set up to handle this activity and conversations have been ongoing for roughly 15 years. Appropriately timing action with administration shifts, federal stormwater permit regulation changes, and City sustainable operation goals is key to the success of this initiative.

When: The City's Law, Finance, and Stormwater Management Departments would need to coordinate efforts to establish this program after the City Administration decides to approach this issue.

Where: This activity affects City stormwater infrastructure on public and private lands.

Why: A stormwater user fee establishes a direct link between the demand for stormwater services based on home size, driveway, and business and parking area square footage. It's been shown to be a fair means of covering the cost of providing stormwater services based on use of these services. The user fee will fund most if not all stormwater services in the City limits. Residents will see an enhanced level of service, a better maintained storm sewer system, less flooding, less erosion, and cleaner river and stream waters. Once

passed, the Stormwater Utility will provide a fund to keep up with federal mandates to improve stormwater infrastructure, allow for innovation in stormwater management, and will ultimately result in cleaner waters in our areas. This activity works to ensure the quality and quantity of local water supplies and encouragement of community engagement in sustainability efforts. It works to protect waterways by repairing and maintaining existing stormwater infrastructure and to aid in funding "unfunded mandates" from the Environmental Protection Agency in regards to stormwater.

How: City leadership is needed to establish a Stormwater Utility; some political pushback is expected but not anticipated at unmanageable scales. Surveys of locales that have already done this suggest annual residential rates would be roughly $1.50 for 400-6,000 sq. ft, $3.00 for 2,000 - 6,000 sq. ft., and $4.50 for over 6,000 sq. ft. A stormwater user fee is defined as a financial charge for stormwater services, such as construction to manage runoff and the use of utility to clean runoff and prevent erosion. Fees are typically calculated based on the amount of impervious area a property contains. Billing structures are dependent on amount of impervious area or areas covered with hard surfaces that don't allow rain infiltration. These include unplanted roof surfaces, driveways, patios, sidewalks, parking lots and other manmade structures. No short-term funding is required from the City, though there will be a ramp up of accounting staff. The City's stormwater team is already set up to begin taking fees after legislative action. City Council action will be required; City Law would draft an ordinance. The aversion to any type of new taxation, even if it's done in other locales, would need to be addressed publicly and a City Council workshop would probably be appropriate. Also, the accounting system out of Stormwater Management would have to be staffed. Political opposition and a down economy may cause this action to be delayed until an appropriate time presents itself.

Resources/Case Studies: Nashville, Tennessee has a successful Stormwater Utility fee program and has been able to advance innovation in stormwater best practices in our state.

Activity 5.4 Building Code Updates

Who: Stakeholders for this activity include City of Knoxville and Knox County Building Inspections and Community Development Departments, Housing and Urban Development, American Society of Heating Refrigerating and Air-Conditioning Engineers, U.S. Green Building Council, Knoxville Community Development Corporation, Knox Heritage, Homebuilders Association, Knox Housing Partnership, building contractors, and Knoxville-Knox County Community Action Committee.

What: This is a long-term plan for transition to adoption and enforcement of the most current energy codes for Residential and Commercial Sectors. The City and county are obligated by the state to adopt a version of the Energy Code: currently, they are both using the 2006 version without amendments while the state is using the 2011 version. The International Energy Conservation Code is an international standard on energy conservation for both residential and commercial properties. It could be supplanted by the International Green Building Code in the long-term. The Residential Energy Code is a broad term used to describe Chapter 11 of the Residential Building Code, which addresses energy conservation. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers standards apply to commercial buildings only. Additionally Energy Star Guidelines are expected to change in 2011.

When: Move towards adoption of the 2012 Code in 2012, to match the state.

Where: This activity lives in the City's code and impacts commercial and residential designers and developers.

Why: This activity works to improve the energy efficiency of local homes and buildings, and to reduce community energy and water consumption by requiring that new buildings be built according to energy efficiency best practices. Adoption of energy codes that match the most current energy codes available for the residential and commercial sectors works to bring Knoxville up to speed with current regional standards. It improves the availability of energy efficient homes, with long-term reduction of energy bills; this in turn increases the long-term value and quality of new construction because of avoidance of unnecessary energy expenditures due to outdated building practices. Overall, a long-term increase in property values is expected as the country

moves towards valuing energy efficiency on appraisals. Newer homes and buildings can be more efficient, with lower energy costs built into the structure of the home. Reducing energy waste in structures generates economic and air quality benefits.

How: Announce plans to update the code for the building community 3-6 months before action to allow the building community ample time to prepare for updates. There should be a 3 month - 6 month notice issued about code updates, so that suppliers and the building community may shift inventory cost effectively. The initial cost to the consumer may increase; however, upfront costs will be minimized by long-term cost reduction on utility bills and increase in property values. City Council approval will be needed for changes to the code. A gradual increase in labor may be needed to enforce energy codes, but once current energy code becomes effectively enforced, additional labor needs are not expected to be as intensive; permit fees could be raised as appropriate to cover any additional costs of enforcement. There has been hesitation to require developers and contractors to meet a code that may significantly increase material costs, so sensitivity will be shown in bringing standards up to current code so as not to shock the industry. Education will be required, and as with any new policy change, the community will need time to adjust to new implications. It would also be beneficial to promote the value of energy efficiency in a property through outreach to the real estate community to ensure the extra cost of efficiency will be transferred into increased home values. To assist with transition to newer codes and stricter enforcement, the City (would/could/should?) offer block grant funded training programs dealing with the requirements of the energy codes and training in the skills necessary to comply. Additional training may be needed as codes are updated.

STEP 1: In summer 2010, the City eliminated exceptions to 2006 Residential and Commercial Energy Codes in response to state mandates and create training opportunities for City builders and inspectors about the 2006 code, with the intent to jumpstart effective compliance and enforcement of the 2006 code.

STEP 2: In fall of 2011, prepare for spring 2012 by reevaluating the feasibility of updating the Residential and Commercial code to 2012 standards by adding international energy code to replace Chapter 11 for Residential Code. In preparation for the required update in 2013, update both codes at least to 2009 standards. Consider updating Commercial to 2012, even if Residential update is deemed impractical.

STEP 3: In 2015, bring both Residential and Commercial Codes up to 2015 Standards, skipping 2012 if it is not adopted in 2012.

Resources/Case Studies: Nashville, Tennessee is adopting the 2012 energy code, to match State standards, with very little political opposition from the building community.

8 – 10 Year Vision

In a decade, we would like to be able to say: it was more than just a plan, it's a reality. The planning efforts and opportunities this area has right now provide the funding and opportunity to chart a good course of action, build the support of stakeholders in all sectors, and give a close look at the way we want to grow and progress as a region. Identifying the barriers and incentives to sustainable growth is touched on in the action items this group developed, but long-term, adoption and enforcement will be key to seeing full blown change in our area.

Some cities have reached a point of integrating all their plans into one, so instead of a sustainability plan, a transportation plan, a long range growth plan, and multiple small vision plans for distinct areas, they are convening stakeholders to merge plans either through reference to each other to avoid duplication or by seamless blending of documents. This creates a kind of community master plan that brings all the players to one spot. A lot of good organizations are doing a lot of good in this community, and as the Community Involvement Group touched on, fighting fragmentation with good communication and partnerships is a key element to success.

Chapter 6: TRANSPORTATION ACTION PLAN

As part of the Electric Vehicle Project, a nationwide Department of Energy initiative, Knoxville has been chosen as one of initially 11 metropolitan areas across the country to host a pilot program for electric vehicles. The project will build and study electric vehicle infrastructure in these areas, and user data will be collected until the end of 2012. By 2012, the area will host at least 20 municipal charging stations, 10 of which will be solar powered. By participating in this program, the City is becoming a pioneer for EV infrastructure. The City's current roles in this project include identifying strategic charging station placement, acting as advisors in stakeholders meetings, and donating parking spaces and electricity for a total in kind value of $214,534.

Other ongoing efforts in sustainable transportation include enforcement of a no-idling policy in the City. While this policy has technically been in effect for some time, the City is improving visibility of this policy and stepping up efforts to more adequately enforce it. The City is also partnering with our local Knoxville Regional Transportation Planning Organization developing a car-share program available throughout the University of Tennessee's campus and downtown that will allow members to check out vehicles by the day or hour. This initiative aims to reduce personal car use, increase carpooling, and foster sustainable travel. Another method of promoting these goals is through the Knoxville Regional Transportation Planning Organization's Smart Trips program. Smart Trips promotes alternatives to driving alone in order to reduce traffic, reduce pollution, and improve air quality. This group provided recommendations that build off existing efforts and in some cases overlapped with other working groups: the Infrastructure Group, Sustainable Growth Group, and Transportation Group. All recommended code revisions to encourage the multi-model use in right of ways (see Activity 4.3).

Transportation Group Energy Inventory Follow up

The Transportation Group was charged with following up on these next steps identified in the 2009 Energy Inventory:

- Encouraging commuting through incentives in the City and community
- Further developing and enforcing the no idling policy
- Quantifying savings and quality of life benefits from reduced vehicular travel

Transportation Group Focus

The Transportation Group recommends affordable and practical ways to encourage commuting and reduction of fuel consumption in Knoxville.

Transportation Group Goals

In order of priority, the group focused on developing recommendations to help the City:

- Enforce existing no idling policy
- Incorporate bicycles as part of the City's motor pool
- Provide a bus pass for City employees
- Alternative transportation staff
- Change development regulations to promote transit biking and walking: zoning changes to allow for sidewalks, bike lanes, etc.
- Car sharing in downtown / University of Tennessee
- Work with micro-group to develop a Green Fleet Policy
- Smart Trips to be included as a Live Well Program

Transportation Group Recommended Activities

Activity 6.1 City and Community Idling Policy Implementation Strategy

Who: This activity directly impacts any City department using vehicles to operate. Other potential stakeholders include local public and private fleet operators, like the University of Tennessee, Knoxville's Utility Board, and Knox County, as well as the general public. Everyone stands to gain from effective implementation of the Idling Policy. The City of Knoxville will be the lead agency. Implementing authority lies with City administrative mandates carried out by Fleet Management.

What: The City of Knoxville operates several fleets of vehicles totaling approximately 1,100 off-road and over-the-road autos, light and heavy duty trucks, specialty service vehicles and construction/maintenance equipment. The fleets are used by various City departments and functions including the Police, Fire, Parks and Recreation, Building Inspections, and Maintenance Departments. The City has an Idling Policy that is currently not enforced. Significant efficiencies in fuel consumption and air emissions can be achieved through a more concerted implementation. Also, it is believed that outreach and education strategies can be effective in raising general awareness, thus generating opportunities for economic and environmental benefits throughout the community. This proposal provides justification and considerations for developing and instituting an Idling Policy Implementation Plan. Idling is the practice of operating a vehicle or piece of equipment in a low-level energized mode without the vehicle or equipment engaged in the activity for which its operation is intended. Warm-up is the period of time required for an engine to achieve its optimum performance efficiency, and is often perceived as the time a vehicle should operate at an idle in advance of engaging the vehicle for its intended use.

When: The Idling Policy is enacted and enforcement can begin at any point.

Where: Anywhere a City of Knoxville fleet vehicle is used.

Why: The goal of this activity is to create a culture of informed awareness to minimize the practice of leaving vehicles in an idling condition for more than minimum periods or for special functions and applications. The objectives of implementing the Idling Policy are to maximize fuel consumption efficiencies, maximize vehicle and equipment service life, and minimize greenhouse gas emissions due to unnecessary fuel consumption. Benefits to a well-implemented Idling Policy include the following:

- Reduced fuel consumption cost: Idling vehicles consume fuel at an approximate rate of 0.25 gal/hr to 1.0 gal/hr. Values depend on vehicle size, model, fuel type and weather and represent the approximate reported range of fuel consumption between 4-cylinder gasoline vehicles and large diesel rigs.

- Savings potential identified: The chart below shows daily, monthly and annual cost for vehicles idling 1 hr/day at a fuel cost of $2.50 per gallon and a 0.5 gal/hr idling fuel consumption rate. For a mid-sized City fleet, potential savings in excess of $250,000 are projected. Fuel savings estimates are dependent upon the following variables:
    - the degree to which unnecessary idling is practiced
    - the degree to which the practice can be minimized
    - the cost of fuel

Vehicles	Daily Idling Cost	Monthly Idling Cost	Yearly Idling Cost
5	$6.25	$125.00	$7200.00
10	$12.50	$250.00	$14,400.00
25	$32.25	$645.00	$7,740.00
100	$129.00	$2,580.00	$30,960.00
1000	$1,290.00	$25,800.00	$309,600.00

Note: Monthly and yearly idling cost is based on a 20-day working month

- Reduced maintenance and replacement cost: The American Trucking Association estimates that one hour of idling per day results in the equivalent of 64,000 miles in engine wear over the course of a year when taking into account all contributing factors. While the actual mechanical wear is variable by vehicle type, model and size, reduction of idling will reduce fleet wear, maintenance and recurring replacement costs.

- Emissions Reductions: Idling reduction will reduce the carbon dioxide and nitrogen emissions that contribute to ground level air pollution and challenges maintaining local air quality attainment status. Air quality attainment is an incentive tied to various federal funding opportunities in transportation and economic development. These sources of funding benefit our community, allowing for a variety of work to be done to improve community health. Companies often avoid locating in chronic non-attainment areas due to more stringent regulations that result in higher operating costs. This activity works to achieve significant emissions reductions through thoughtful idling practice. The chart below shows daily, monthly and annual carbon emissions for vehicles idling 1 hr/day at a carbon emission rate of 20 lbs/gal and a 0.5 gal/hr idling fuel consumption rate. For a mid-sized City fleet, a potential annual carbon emission reduction of 2,000,000 pounds is possible.

Vehicles	Daily Carbon Emissions (lbs)	Monthly Carbon Emissions (lbs)	Yearly Carbon Emissions (lbs)
5	50	1000	12,000
10	100	2000	24,000
25	250	5000	60,000
100	1,000	20,000	240,000
1000	20,000	200,000	2,400,000

Note: Monthly and yearly idling cost is based on a 20-day working month.

How: The overall activity is to validate and implement the City's Idling Policy so it is enforced uniformly and fairly across City departments and can be integrated into community idling minimization efforts. It also includes identifying definable goals, metrics for tracking, and methods for changing vehicle operator idling behavior. Specific tasks will likely include the following:

- Formally adopting the City's Idling Policy, so that recognition is pervasive throughout City government from the top down, including visibility in employee handbooks, job performance reviews, signs, and daily management practice

- Developing an Idling Policy implementation plan identifying scope and schedule of implementation both temporally and geographically and that details management approach, tracking methods, partnering and public outreach

- Developing idling and fuel consumption tracking methods that make best use of current data processing systems

- Conducting Idling Policy training, routine awareness and refresher activities

- Identifying incentives (both positive and negative) to be managed through existing Human Resources programs and infrastructure

- Outreach method and programs to other local public and private fleets and the general public

In the short-term, political support for the plan and plan development are needed. The plan will state its value, anticipate its cost savings, and live in the Fleet Department for updating and tracking. Policy & Communications will work with Fleet to track emissions and cost savings and develop incentives. It is believed that the City's fleet management software (Fleetwave) and data logging infrastructure are currently capable of capturing data to support idling tracking and data management. Human resources in the City's information technologies area will be required to interface with Fleet Management and various departments to make the tracking function fully operational. Staff times in the short-term will be absorbed into current staffing of affected departments. The most significant issues to overcome are misperceptions about vehicle warm-up requirements and idling, costs associated with vehicle start up, and vehicle operational and service capabilities relative to idling. Overcoming cultural and personal convenience behaviors would be best addressed through consistent implementation of idling and fuel consumption job performance expectations and execution across all departments. Exclusions for special services, emergency services, and extraordinary applications will be a part of the plan.

Resources/Case Studies: Idling laws for long-haul diesel rigs are ubiquitous across the United States. EPA has published a compendium of state and municipal laws, available on the internet. Numerous municipalities have also developed idling reduction policies and programs. The Illinois Sustainable Technology Center, Institute of Natural Resources Sustainability, and University of Illinois at Urbana-Champaign have published a well-organized white paper "Idling Reductions Programs in the Chicago Metropolitan Area" that addresses both municipal fleets and community outreach and integration.

Activity 6.2 Bike Pool for City Employees

Who: This activity impacts City employees and the Fleet Department.

What: This is a proposal to examine the possibility of launching a bike program that would allow City employees to reserve a bicycle from a City bike pool for transportation to work related purposes.

When: This activity requires initial capital investment and would be a good grant candidate. Several cities are trying this in a pilot stage through grants; if funding is pursued for this activity, it should start small.

Where: One of the challenges of hosting a bike pool is limited space in the City County Building. Not only would a secure space be needed for bikes, probably in the parking garage, but also a location reserved to hold helmets, likely inside where the bikes are checked out. As the program grows, other municipal locations could be examined as host sites for bikes.

Why: This activity works to reduce vehicle miles traveled by City employees and to increase the number of employees who choose an alternative to driving alone for work-related travel. It also works to increase air quality and promote a healthy lifestyle through activity. The check-outs would be tracked by a Fleet staff member charged with managing the bicycle pool. It is possible that such a program could reduce minor costs associated with the City of Knoxville's motor pool. Assuming an average of 10 trips a month are taken by the new bicycles instead of by car and those trips are an average of 2 miles roundtrip, this program would save 240 vehicle miles traveled each year. It would demonstrate the City's promotion of bicycling as a means of transportation and the willingness to take the lead on sustainable transportation. The air quality benefits for one year of the program would consist of reductions of: 0.39 kg of volatile organic compounds, 0.27 kg nitrogen oxide, 4.6 kg of carbon oxide, and 102 kg of carbon dioxide. If the program is successful, these benefits could increase in the future.

How: Initially, it is recommended to start with a purchase of 4 bicycles to be treated as part of the motor pool, which would be available for City employees for travel to meetings during the work day. Employees who wish to use the bicycles should receive bike safety instruction and guidelines for the use of the bicycles. Helmets and locks would also be provided when someone checks out a bicycle. For trips in the urban area less than 5 miles, biking takes the same time or even less time than driving, due to congestion, traffic lights and the time it takes to find and access vehicular parking. Procurement of 4 bicycles would be needed, with a cost estimate of $400/bicycle; 4 sets of helmets and locks are estimated at $120. General maintenance estimates assume $30/month to contract with a local bike shop. Short term funding would be roughly $1,720, with long-term funding of $360/yr in maintenance fees. No request for proposals would be necessary, as the funds are below bidding limits, though the City may decide to issue an Request For Proposal for bicycle purchase and maintenance as a package. Staff time would be needed to manage the bicycle fleet, though there is not enough work there to warrant a new position. The Knoxville Regional Transportation Planning Organization (TPO) would be able to provide safety education for employees who wish to use the bike pool program. Several choices of bike sizes, helmets and locks would be advisable. Program details will need to be worked out once funding is secured, including the need to ensure there are bike racks at City-operated destinations for employees such as the Coliseum, a process to handle any stolen bicycles, employee training and safety, and coverage for any liability.

Resources/Case Studies: Boston, Massachusetts, Houston, Texas, and Chattanooga, Tennessee have bike share programs or bike pools available to their employees.

Activity 6.3 Complimentary Buss Pass for Commuting City Employees

Who: This activity would serve as an incentive to any City employee who would like to commute using the Knoxville Area Transit (KAT) system. It would involve coordination with the TPO's Smart Trips Program so that recipients log their transit commutes in the existing system.

What: A program providing City employees with a free bus pass to and from work.

When: This activity requires dedication of a portion of operating costs and would likely be an addition to Risk Management's annual budget.

Where: Bus passes would ideally be housed in the City's Risk Management Department. Promotion of this incentive would be communicated to City employees via the City newsletters.

Why: This activity works to reduce vehicle miles traveled by City employees and increase the number of City employees commuting by public transit which can be tracked in the Smart Trip database. It works to improve air quality and to open up more downtown parking for short-term use without the need to build more facilities. Assuming 15 participants in the pass program with average roundtrip commute distance of 25 miles, the air quality benefits for the first year of implementation are estimated to be reductions of 465 kg of volatile organic compounds, 325 kg of nitrogen oxide; 6680 kg of carbon; 1.12 kg of particulate matter 2.5; and 41,529 kg of

carbon dioxide. The City can lead the way for other employers to implement similar programs. Assuming the program is successful, the benefits would increase in the future.

How: Currently only 4 City employees report using transit to commute on the Smart Trips logging system. If the transit pass program increased that number to 15, the cost would be $10,000 a year if no special agreement was negotiated with KAT. This activity is low intensity by way of staff time commitment; it includes program implementation, oversight, and promotion. There may be arguments that it is unfair to pay for some employees to commute and not others. It can be countered that transit is not as convenient as driving alone and it helps to offer incentives to use a cleaner means of transportation. It also increases the availability of parking spaces in the City County Building and the downtown area – freeing parking for visitors and shoppers.

Resources/Case Studies: The Knoxville-Knox County Metropolitan Planning Commission provides a free bus pass each month for any employee who regularly takes transit to work; currently 4 employees are taking advantage of this program. The State of Tennessee provides this benefit in Nashville.

Activity 6.4 City Staff Dedication to Promotion of Alternative Transit

Who: This recommendation impacts City of Knoxville staff, the Knoxville Regional Transportation Planning Organization (TPO), the County Health Department, and the community at large.

What: The suggestion is to dedicate the full amount or a portion of a City staff person's time to promoting alternative transportation to City employees and community wide. The staff person would coordinate with the TPO Smart Trips program, the TPO Bicycle Program, Health Department, and City departments to promote alternative transportation through programs and events.

When: Existing sustainability staff works with the TPO to distribute Smart Trips materials to City employees during the annual spring commuter challenge, but does not have the ability to prioritize full time promotion of alternative transit in addition to federal and local workloads. The City administration will need to weigh term priorities and assign staff to this effort based on those decisions.

Why: This activity works to improve air quality, reduce vehicle miles traveled by City employees, reduce transportation-related fuel consumption and emission, and to increase the number of people who live and/or work in the City of Knoxville who choose alternatives to driving alone. This action would capitalize on existing resources like Smart Trips, the Bicycle Program, and the Healthy Kids, Healthy Communities program. The City would be leading the way in promoting healthier transportation choices. It is difficult to quantify the emissions reductions of a single staff person, but programs and strategies are rarely successful without dedicated staff to implement them. Progress of this position would be measured in emissions reductions, reduced parking requirements in Knoxville's core, and an overall increase in the amount of physical activity through bicycling and walking.

Where: Ideally, the City employee responsible for this initiative would be housed in the Fleet Department.

How: If an existing staff person is designated, a portion of their entire work load would need to be delegated to others to allow them to be successful. If a new person is hired, the cost would be considered as part of a budget request and deliberated by City Council.

Resources/Case Studies: The City of Roseville, California is cited as having staff dedicated to the successful promotion of alternative transit use.

Activity 6.5 Develop a City of Knoxville Green Fleet Policy

Who: This activity impacts any City departments that deploy fleets, employees utilizing fleet vehicles, and vendors that provide fleet vehicles or parts. In conjunction with Knoxville-Knox County's Community Action

Committee (CAC), the City was able to leverage an AmeriCorps position to develop a Green Fleet Policy in early 2011 based on national research of best practices and collaboration with the University of Tennessee's East Tennessee Clean Fuels Coalition.

What: A Green Fleet Policy works towards developing and maintaining a fleet of vehicles that emit low or zero emissions; typically powered by fuels other than gasoline or diesel, hybrids, or electric cars. The point is to reduce the amount of particulate matter, or particles of soot, dust, smoke, fumes, aerosols or other airborne material, the presence of which exacerbates our already fragile air quality and high asthma rates. Gasoline gallon equivalent is a formula that uses energy equivalents to compare the benefit-cost of gas versus alternative fuels. The Green Fleet Policy touches on measurement, tracking, and fleet conversion over time based on benefit-cost analysis.

When: The Transportation Group proposed that within one year of adopting this work plan, a committee charged with developing a Green Fleet Policy delegating specific responsibilities for reducing City fleet fuel consumption and related emissions be established. Due to donated AmeriCorps time, the City was able to develop a policy that is ready for an internal soft launch in 2011 to work out any issues and a hard launch in 2012.

Where: The activity impacts the City's Fleet Department the most, as they will be responsible for the policy's implementation. They are willing partners who have been involved in the policy's development and are actively thinking through its implementation.

Why: Aside from the obvious economic, health, and quality of life benefits that come from reducing local emissions, there are significant fuel cost savings from the following: increased average fuel economy, pairing right vehicle for the right job, and reduction in vehicle idling. A Green Fleet Policy can work to create jobs by supporting American, regionally-produced alternative fuels. Being proactive about reducing emissions allows Knoxville to maintain our recent air quality attainment status. Non-attainment status hinders economic development and every green house gas reduction impacts the bottom line of economics, environment, and health.

This activity works to reduce fuel consumption, emissions, and maintenance costs of the City fleet, to support KAT's efforts to make their operations cleaner, greener and more efficient, and to reduce transportation-related fuel consumption and emissions. By reducing fleet fuel consumption and increasing the use of alternative fuels, the City can build a hedge against fuel shortages and price spikes caused by natural disasters and political instability in other parts of the world. Establishing a workable framework makes Knoxville competitive with other cities in the southeast and U.S. that are becoming more proactive about minimizing fleet emissions. Creating an effective fuel cost management system not only makes Knoxville a national example but also works to provide flexibility in our budget to insulate the City from unpredictability in fuel prices.

How: National best practices were examined to create Knoxville's Green Fleet Policy. Examples of other city standards include: decrease petroleum consumption by 30%; increase the use of alternative fuels and the number of alternative fuel vehicles by 30%; and decrease fleet vehicle miles traveled by 30% by 2020. For certain actions, like reducing unnecessary fuel consumption through the No Idling Policy, cost savings are immediate once drivers are on board. Higher fuel economy and alternative fuel vehicles typically have more expensive capital costs but can save money over the vehicle's life when life-cycle costs such as maintenance, insurance, and gas are included. Several alternative fuels are cheaper per gasoline gallon equivalent than gasoline and diesel; others like biofuels have the built-in flexibility based on their blended nature to allow the fleet manager to control the final fuel cost by adjusting the blend. New refueling infrastructure for alternative fuels can be low-to-high in cost depending on the fuel, and sometimes grants can help reduce upfront costs substantially.

Low-cost items can likely be absorbed by the City, as was the electric vehicle charging infrastructure. Higher budget items can be deferred to grant opportunities, or if the return on investment is appropriate, can be built into the City's budget. The long-term goal of the policy is to reduce the City's vehicle, fuel, and fueling system costs. The policy proposes that contracts for fleet vehicles and fleet fuels be revised to incorporate long-term

City goals into what fleet vendors are expected to provide. The policy accounts for items such as lifecycle analysis and mandates the consideration of things like hybrid battery replacement disposal costs prior to purchase. There is resistance to the use of alternative fuel vehicles by emergency responders and the policy accounts for exemptions when necessary. Implementation of the policy will only be effective with a flexible team approach to problem solving and a common sense approach to new technologies and the bottom line.

Resources/Case Studies: The following cities have comprehensive green fleet programs: San Jose, California, Seattle, Washington, and Toronto, Ontario, which is anticipating a savings of $2,000,000 over 4 years.

Activity 6.6 City Employee Promoting Alternative Transportation

Who: This activity impacts employees of the City of Knoxville and requires a team effort with the Finance and Risk Management Departments.

What: The proposed action is to include Smart Trips as a part of the City's wellness incentive program, Live Well.

When: A grant request for technical assistance from the Environmental Protection Agency on establishing commuting incentives as part of the existing employee benefit package was made in early 2011. If that is honored, the City will host a workshop with the Environmental Protection Agency to begin this program. If it is not, the City will do further research on how to implement this idea and a requisite cost analysis.

Where: This activity will be housed in the City's Risk Management Department.

Why: The City is significantly behind the county in percentage of commuters. Adding employee incentives to make riding alone less attractive works to reduce vehicle miles traveled by City employees during commutes to and from work. It works to reduce transportation related fuel consumption and emissions and to encourage community engagement in sustainability efforts. By reducing vehicle miles traveled by City employees, community quality of life is positively impacted through air quality improvement and higher employee activity levels. It also works to increase the number of people who live and work in the City of Knoxville that choose alternatives to driving alone, improve air quality, and open up more downtown parking for short-term use without need to build more facilities. The City would be leading the way in promoting healthier transportation choices and employees would be receiving an additional health package option.

How: With or without technical assistance from the Environmental Protection Agency, this activity will require working through benefit- cost analysis with the City's Risk Management Department to have Smart Trips incorporated into the City's benefits package and to incentivize the program through the existing Live Well program. It will require cost conversations with Risk Management and Finance. City employees would be responsible for reporting their own participation to Smart Trips and Risk Management. Developing the program details for reporting, rollout, and employee education will require a survey of national best practices.

Resources Case Studies: To date, Wisconsin State Department of Transportation has been identified as having a very successful program incentivizing employee commuting.

8 – 10 Year Vision

Long-term, this group would like to see the City with a fuel efficient fleet, a healthy commuting base, a diversity in how employees get to work, and more commuting in the community overall. Good bike lanes, a healthy and viable mass transit option, and a network of greenways and sidewalks all work to make Knoxville an obvious choice to live and participate in. The economics this group reached are trackable and qualifiable, but there are intrinsic benefits as well that boost an economy, especially in budget consious times. The City will track and evaluate the progress of intiatives on an annual basis and adjust course accordingly to address weak areas.

WHAT CAN YOU DO?

Knoxville-Knox County Community Action Committee donated AmeriCorps Volunteer time to creating a Citizen's Guide to Sustainability that is tailored to our area. The purpose of this guide is to share sustainable and energy efficient best practices with residents in east Tennessee, and to encourage each individuals to take economic, environmental, and social responsibility into their own hands. It presents general environmental issues in basic terms and provides steps that individuals can take to ensure resources are available to future generations. Individual handouts are also available for viewing and download, dealing with:

- Air Quality
- Energy Conservation
- Land Use
- Recycling
- Local Food Production
- Water Conservation

Please visit the City's Energy & Sustainability web site to view the guide:

www.cityofknoxville.org/sustainability

APPENDIX

List of Organizations

Central Business Improvement District (CBID)
Knoxville Area Transit (KAT)
Knoxville-Knox County Community Action Committee (CAC)
Knoxville-Knox County Metropolitan Planning Commission (MPC)
Knoxville Regional Transportation Planning Organization (TPO)
Knoxville Utilities Board (KUB)
Knoxville's Community Development Corporation (KCDC)
Oak Ridge National Laboratory (ORNL)
Public Building Authority (PBA)
Southern Alliance for Clean Energy (SACE)
Tennessee Valley Authority (TVA)
University of Tennessee (UT)

Action Item Status and Next Steps

Activity	Description	Status	Start Date	Completion Date	Next Steps
Activity 1.1	Development of an Energy & Sustainability Implementation Advisory Board	Research Phase	January, 2012	January, 2013	Work with Mayor and new admin., one year term limits if appointed.
Activity 1.2	Develop a Citizen's How - To Guide to Sustainability	Complete	January, 2011	July, 2011	Update online in June 2012
Activity 1.3	Information Sharing: Building Community Support and Political Will	Active	September, 2007	N/A	Meet regularly with stakeholders and elected officials, utliize multimedia to push out activites
Activity 1.4	Information Gathering: Identifying Community Concerns	Active	September, 2007	N/A	Collect / compile survey responses
Activity 2.1	Green Building Code Incentives	Research Phase	June, 2010	December, 2011	National BMP survey, Policy Development (need official policy)
Activity 2.2	Streetlight, Light Watchmen, and Parking Garage Lighting Retrofits	Research Phase	October, 2009	January, 2014	Propose in Ameresco Phase II scope of work to the new adminstration
Activity 2.3	Revolving Loan Pilot for Residential Energy Retrofits	Research Phase	December, 2009	N/A	Keep eye out for funding ops, keep partner networks strong
Activity 2.4	Measurement & Education: Energy Manager Position	Inactive	?	?	New staff or adding to existing staff dutues TBD by new adminstration
Activity 3.1	Edibles in Right-of-Ways and Public Locations	Active	June, 2010	N/A	National BMP survey, Policy Development
Activity 3.2	Encourage Home Landscaping with Natives and Edibles	Active	July, 2011	N/A	Material released on web, but needs coordinated education / outreach effort
Activity 3.3	Community Gardens	Active	February, 2010	February, 2012	Needs licence and resolution, public meeting, City Council, and web design
Activity 3.4	Employee Purchasing Guide	Complete	August, 2010	September, 2010	Update online in August 2012
Activity 3.5	Integrating Green Purchasing: Procurement Personnel Training	Research Phase	August, 2010	N/A	Need to regroup the buyers and roll from the top down
Activity 3.6	Create a Sustainable Purchasing Staff Position	Inactive	?	?	New staff or adding to existing staff dutues TBD by new adminstration
Activity 3.7	Elimination of Unnecessary Disposables	Research Phase	August, 2010	N/A	National BMP survey, Policy Development (need official policy)
Activity 3.8	Recycling Services Contractual Framework	Complete	June, 2010	August, 2010	PBA completed and managing use
Activity 3.9	Downtown Permanent Recycling	Active	September, 2010	December, 2012	New service to begin with residential curbside recycle pickup
Activity 3.10	Recycling in City Parks	Research Phase	May, 2010	N/A	Pilot was successful, need to request funding in this years budget cycle with Public Service
Activity 3.11	Event Recycling in Public Spaces	Active	October, 2010	N/A	Recycling clear stream trailer purchased for joint City County use, Special events now environmentally evaluated
Activity 3.12	Recycling in the City and County Facilities	Active	September, 2010	N/A	PBA purchased a compactor and went single stream in the City County Building, we need a policy for all our facilities
Activity 3.13	Electronic Waste Recycling	Active	2009	N/A	Program needs to grow; look for promotional opportunities
Activity 4.1	Subdivision Regulation Revision	Active	April, 2009	December, 2013	This needs to be a part of the HUD grant deliverables
Activity 4.2	Plantings in Right of Way	Active	2007	N/A	National BMP survey, Policy Development (need official policy)
Activity 4.3	Multimodal Accommodation in Right of Way	Active	2007	N/A	National BMP survey, Policy Development (need official policy)
Activity 4.4	Utility Coordination in Right of Way	Active	N/A	N/A	National BMP survey, Policy Development (need official policy)
Activity 5.1	Metropolitan Planning Commission – City of Knoxville Interaction Policy	Active	December, 2012	N/A	Get with MPC at budget planning cycle start for FY 2012-13
Activity 5.2	Metropolitan Planning Commission Sustainable Code Policy	Active	April, 2009	December, 2013	This needs to be a part of the HUD grant deliverables
Activity 5.3	Stormwater Utility Policy Proposal	Inactive	?	?	Needs to be discussed with new adminstration
Activity 5.4	Building Code Updates	Active	2010	December, 2012	This needs to be coordinated with the new Building Inspections Director
Activity 6.1	City and Community Idling Policy Implementation Strategy	Active	April, 2011	December, 2011	Policy is done, needs top down mandate from new adminstration