

Improved TRANSPORTATION

“At the root of sustainability for transportation are *options* – choice of route, choice of mode – and this plan helps facilitate the number of options for moving people and goods efficiently and safely within the City of Charleston.”

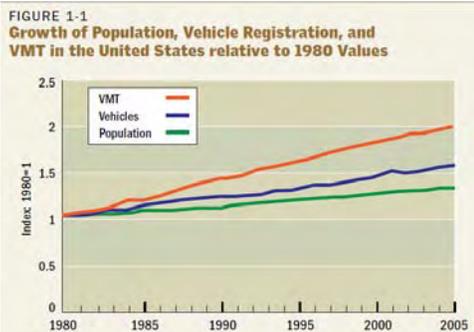
Jennifer Humphreys, AICP
Wilbur Smith Associates
Subcommittee Chair

The previous chapter mentioned that 40% of Charleston's greenhouse gas emissions are transportation related. This chapter continues the discussion about how to minimize transportation-related emissions.

It seems that an obvious way to reduce these emissions would be to improve vehicle and fuel technologies. But it turns out that, by itself, this cannot succeed. Even though vehicle and fuel technologies are advancing quickly, the total number of miles traveled in vehicles is expected to rise.¹

As the graph shows, between 1980 and 2005, the number of miles Americans drove grew three times faster than the population. This trend is expected to continue into the near future. Between 2005 and 2030 the number of miles driven is expected to grow 48% -- more than twice the population growth of 23%.²

In the Charleston region, the rate of population growth and increase in Vehicle Miles Traveled (VMT) is expected to align more closely than this



Source: Federal Highway Administration. "Vehicle Registrations, Fuel Consumption, & Vehicle Miles of Travel as Indices," *Highway Statistics 2005*.

national trend. According to the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) Long Range Transportation Plan (2003), the region's population is expected to grow by 34.6% from 2003 to 2030, with VMT growing approximately 39% in that same time period.

According to the Urban Land Institute, "the United States cannot achieve...large reductions in transportation related emissions without sharply reducing the growth in the number of miles driven."³ This conclusion is echoed by many groups, including the American Association of State Highway and Transportation Officials (AASHTO), which is now urging that the national growth rate of vehicle miles traveled be cut in half.⁴

Reducing Vehicle Miles Traveled

So why is Vehicle Miles Traveled soaring in the US? Because most newer communities, including Charleston's suburbs, separate workplaces and schools from residential areas and make residents dependent on automobiles for basic needs.

One way to reduce VMT is to rethink community design so that it is easier and safer to bike, walk, or use public transit. Borrowing principles from older areas like the Charleston peninsula, the nation's new, sustainable communities site homes closer to schools and workplaces, leaving green space to be enjoyed by the whole

IMPROVED TRANSPORTATION

ACTIONS

1. Reduce dependence on single-occupancy vehicles.
2. Increase convenient, reliable public transportation.
3. Expand bicycle and pedestrian options.
4. Increase fuel efficiency and use of biofuels.
5. Improve air quality.

BENEFITS

-  Protect clean air
-  Improve public health
-  Reduce traffic congestion
-  Reduce traffic noise
-  Enhance quality of life
-  Slow Climate Change
-  Raise Awareness

population. This provides expanded transportation options that past development patterns did not support. On average, residents of new, sustainable communities drive 20% to 40% less than in traditional suburban communities.

Even better, residents of Atlantic Station in mid-town Atlanta average 8 VMT per day, compared to the regional average of 32 VMT per day.⁵ Instead of using cars, Atlantic Station residents are walking, biking in dedicated lanes, or using a free trolley that carries 60,000 people per month to and from a nearby transit site. Also, the complex features a “commuter café” where people can find out about mass transit, car- and bike-sharing, and other sustainable commuting options.⁶

More Ways to Reduce VMT

Beyond recommending that the City encourage sustainable community design, this plan also recommends that the City take additional steps to reduce Vehicle Miles Traveled. Before discussing these recommendations, it should be noted that the City is already making important progress in this area:

Commuter Rail: State funds have been requested to create a commuter rail line between Summerville and Charleston. The estimated cost of \$75 million to initiate commuter rail service is a modest investment

CHARLOTTE LIGHT RAIL A BIG SUCCESS



In November 2007, the City of Charlotte opened a light rail line between its downtown area and the suburban South End. Within months the line was carrying nearly twice the number of weekday riders anticipated. Weekday ridership was expected to be 9,100 in the first

year. Instead, ridership averaged about 16,500 in June 2008.⁸

Interestingly, 72% of Charlotte’s light rail riders are new to public transit, with large majorities better educated and more affluent than the City’s bus passengers.⁹ Also, public transit ridership increased across the board by 16% after the light rail opened, easing fears that light rail would simply steal ridership from bus lines.¹⁰

Another success attributed to the new light rail is that it was designed to become a magnet for “transit-oriented development” – higher-density, mixed use communities deliberately created along the rail line. This transit planning was thoroughly integrated to foster economic development goals. In 2005, one report said that “the momentum of economic development in this corridor in anticipation of light rail has been outstanding,” with property values along the corridor increasing 89% between 2001 and 2004.¹¹

City officials encouraged this trend by creating special transit-oriented zoning near the rail line. Thousands of new dwelling units have been built or are planned in these areas.¹² As the City continues to encourage and approve new projects,¹³ Charlotte’s transit authority estimates that development along the rail line could total \$1.5 billion by 2011.¹⁴

compared to the cost of design, rights-of-way acquisition, and construction for adding more lanes to Interstate 26. Charleston's Mayor Riley strongly supports the commuter rail idea, saying, "I think the reasonable human expectation should be that people will use it like crazy."⁷

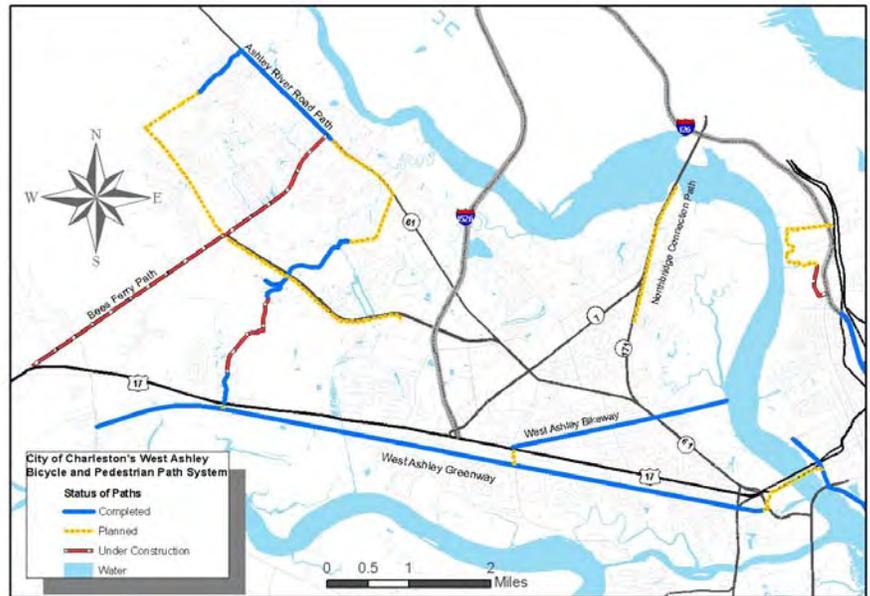
Bicycle & Pedestrian Network:

Charleston is also expanding biking and walking routes, as well as installing new bike racks throughout the downtown commercial district. Recent successes include a bike lane on the new Ravenel Bridge that continues on East Bay Street; a bike and walking path along the Ashley River; and extensions of the West Ashley Bikeway and Greenway among others especially regional connections. Another potential project is a bike lane on the Ashley River Bridge that connects the West Ashley Greenway to the Peninsula. Moreover, in May 2009, the City made a commitment to seek "Bicycle Friendly Community" status from the League of American Bicyclists. This will require creating a more complete network of bike routes and expanding efforts to promote bicycling.

This plan also recommends that the City work with state and regional partners to:

Promote more alternatives to single occupancy vehicles.

Strategies include considering support for programs that reward employees for carpooling, walking, biking, or using public transit; designing new "complete streets"



The growing pedestrian and biking greenways serve as alternatives to vehicular travel.



Sidewalks, crosswalks and trees make neighborhoods more walkable and safer.

that accommodate bicycles, pedestrians, public transit riders, and public transit vehicles and evaluating vehicle-free tourism areas in downtown Charleston.

Provide more support for biking and walking.

Strategies include developing a bicycle and pedestrian plan for the City and restriping appropriate streets to accommodate bicyclists, as



Biking to work can be healthy and save money.

well as fulfilling the requirements necessary to qualify for “Bicycle Friendly Community” status.

Further expand public transit. Strategies include locating bus routes to promote access to public service facilities to make paying bills and getting permits easier via alternative transit; requiring bus stops within new

developments and redevelopments along bus routes; and working with CARTA and Tri-County Link to enhance bus stop safety, provide adequate bus stop seating, and expand bilingual services.

Fuel Efficiency & Cleaner Fuels

Moreover, this plan recommends that the City help increase fuel efficiency and the use of cleaner fuels, again in partnership with state and regional agencies. This is important not just to reduce harmful emissions, but also to protect public health.

Air quality is a component to a sustainable and healthy Charleston. The EPA ranks air quality based on its health concerns through the Air Quality Index. There are six rankings from Good to Hazardous. Each level is



The CARTA bus system is a valuable asset for the City and its citizens.

determined based on the population size that is likely to be negatively affected by the quality of the air. “Unhealthy for Sensitive Groups” is determined when people with lung disease, older adults and children are at a greater risk from exposure to ozone, because persons with heart and lung disease, older adults and children are at greater risk from the presence of particles in the air. While most days of the year Charleston County experiences “Good” air quality, in 2008 there was one day where the air quality was considered as “Unhealthy for Sensitive Groups,” based on the US EPA’s Air Quality Index (AQI). There were no days in 2008 when Charleston County’s air quality was considered to be in the AQI’s “Unhealthy”, “Very unhealthy” or “Hazardous” categories.

The American Lung Association (ALA) has raised concerns about air pollution in Charleston County. Particle pollution, which comes mostly from diesel exhaust, is “the most dangerous, and deadly, of the widespread outdoor air pollutants,” according to the ALA. These small toxic particles cause asthma, stroke, cancers, heart disease, and premature death.¹⁵

Strategies for reducing fine particle pollution and other harmful emissions include:

- Setting high standards for the purchase, use, and maintenance of fuel-efficient City vehicles;
- Supporting similarly high standards for the CARTA fleet;
- Continuously improving traffic flow;
- Enforcing anti-idling policies and anti-idling programs and technologies; and
- Supporting strict enforcement of speed limits, which reduces fuel consumption.



The City has a growing fleet of hybrid vehicles with high mileage and low emissions

In addition, this plan recommends that the City support a significant reduction in emissions from truck, train, and ship traffic. Specifically:

- Decreasing congestion of freight corridors by road



Proposed street network on Johns Island supporting connectivity between existing and new neighborhoods

- and rail to decrease freight travel times; and
- Using cleaner fuels and reducing unnecessary idling by ships, trains, buses, and trucks.

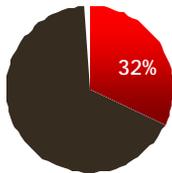
Specifically, this plan urges the City to identify opportunities to participate in the decision making process for policy and actions related to the Port of Charleston and local industries that have a significant impact on fuel efficiency, cleaner fuel, and air quality.

In 2008, the Charleston County Medical Society and the South Carolina Medical Association called for a reduction in fine particle pollution, expressing

particular concern about port facilities in and around Charleston.¹⁶ The City should play a more prominent role in encouraging emissions reductions from port facilities, industries, and vehicles.

Recommendations

Improved Transportation Goals, Actions & Recommendations



Quantifiable measures could achieve 32% of 2030 reduction goal (equal to 355,517 mtCO₂e). See page 21 for details.

ACTIONS

1. Reduce dependence on single-occupancy vehicles.

- A. Keep “vehicle miles traveled” within the City at the 2010 level.
- B. Move the City towards a fully multi-modal transportation system.
- C. Adopt and implement a Complete Streets Ordinance.
- D. Support employer-based programs that encourage alternative transportation.
- E. Encourage vehicle-free tourism.

2. Increase convenient, reliable public transportation.

- A. Support collaborative programs that encourage the use of public transit.
- B. Show visible support for public transit through the location of city events and public service facilities.

3. Expand bicycle and pedestrian options.

- A. Adopt and implement a city bicycle and pedestrian plan.
- B. Restripe corridors for bicycle use.
- C. Acquire “Bicycle-Friendly Community” status.
- D. Provide incentives for City

employees to commute or conduct business using bicycles.

4. Increase fuel efficiency and use of biofuels.

- A. Set high standards for the purchase, use, and maintenance of City vehicles.
- B. Support reduction of emissions from freight-related diesel trucks, trains, and ships.
- C. Support strict enforcement of speed limits.
- D. Study the benefits of providing free or preferred parking for high-efficiency vehicles on City and County lots and decks.
- E. Improve vehicle flow by using transportation system management.
- F. Support anti-idling programs and technologies.
- G. Research a property tax assessment on vehicles that is based on emissions rather than value.
- H. Support purchase, use, and appropriate maintenance of high-efficiency vehicles for the CARTA fleet.

5. Improve air quality

- A. Reduce emissions from small-motor equipment.
- B. Raise public awareness of the need to reduce air pollution outdoor burning and emissions from inefficient, outdoor wood-burning stoves. Educate the public on the existing laws and available cleaner-burning technologies and materials.

T1. REDUCE DEPENDENCE ON SINGLE OCCUPANCY VEHICLES

T-1A: Keep “vehicle miles traveled” within the City at the

2010 level.

Summary of specific issues: Vehicles occupied by one person (“single-occupancy vehicles” or SOVs) generate much greater greenhouse gas emissions per passenger-mile than carpools or public transit. SOVs also increase traffic congestion, which itself increases emissions due to traffic idling.

In order to reduce dependence on SOVs, the City’s primary goal should be to stabilize, or eventually reduce, the total annual “vehicle miles traveled” (VMT) within the City. This would provide the largest possible reduction in greenhouse gases by the largest group of people.

Strategy/Action Plan: City staff should establish a method for quantifying VMTs within City limits, one that can be documented and monitored annually. The inventory should be GIS-based and cover all streets maintained by the City. Ideally, traffic counts for these streets will be regularly updated so that changes can be monitored. In addition, reducing VMT should become a cornerstone of future comprehensive land use and transportation planning goals for the City. (See Recommendation C1.)

Implementation responsibilities/ assignments: The departments of Planning, Preservation, and Sustainability, Economic Innovation, and Traffic and Transportation should be responsible for creating this inventory, combining GIS skills with the skills needed to measure traffic counts.

Regional partners for funding and implementation: To minimize cost, assistance should be sought from regional partners. Many data may already be collected and on a collection schedule. Potential partners include: the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG);

South Carolina Department of Transportation (SCDOT); and Charleston County RoadWise Program.

Benefits anticipated, aside from greenhouse gas reductions: Improved air quality and improved public health, both from cleaner air and more walking, cycling, etc. Also, a reduction in VMT means less traffic congestion, enhancing quality of life.

Timeline for implementation: The initial inventory of City streets and traffic counts can begin immediately, in 2009. GIS based street data and a robust traffic count database are readily available and free of charge. By setting the goal of sustaining VMTs for the year 2010, it is intended that the database be complete and ready for annual updates beginning in 2010.

T-1B: Move the city toward a fully multi-modal transportation system.

Summary of specific issues: The City should continue to identify, enact, and enforce policies that support multi-modal transportation of people and goods. This will require significant changes in policies governing community development and redevelopment. Communities should be located and designed to support all transportation modes, including public transit, bicycling, and walking. (See Recommendation C1.)

Strategy/Action Plan: The City should enact a citywide multi-modal transportation plan as part of the City Comprehensive Plan. The plan will identify transportation solutions to support land use decisions on a corridor level, preserving system connectivity and thoroughfares. The following should be considered:

- Multiple modes of transportation
- Corridors with significant congestion
- Regional connectivity

Recommendations

- Network connectivity
- Identification of transit nodes, and encouragement of “transit-oriented” development

Further, the City should include policies that will reduce dependence on SOVs, such as:

- Partnering in Travel Demand Management Programs that sponsor, coordinate, and encourage carpools, vanpools, and group-based transportation,
- Creating a permitting system that offers incentives for developments that support alternatives to SOVs,
- Participating in regional transit planning initiatives (bus and rail planning activities).

Because transit service is both costly and regional in nature, the City should strengthen and create necessary partnerships, continuing to play a significant role in regional transit planning through BCDCOG. This planning should include bus, rapid bus, commuter rail, light rail, and/or any other modes deemed reasonable.

Implementation responsibilities/ assignments: Most of the responsibility for implementation lies with the Department of Planning, Preservation, and Sustainability in coordination with the Department of Traffic and Transportation and regional partners.

Regional partners for funding and implementation: Many agencies, including Charleston County, the SCDOT, and BCDCOG, are involved in transportation planning. Specifically, BCDCOG has initiated a travel demand management program, making that agency an ideal partner for introducing such programs to businesses within the City of Charleston. Also, the City will eventually share experience and successes with neighboring communities.

Benefits anticipated, aside from greenhouse gas reductions: Health benefits from cleaner air and additional physical activity, as well as an increased sense of community as services and activities become more localized and “community based.”

Timeline for implementation: The City’s update of its comprehensive plan in 2009 affords a good opportunity to plan for a multi-modal transportation system. Implementation and enforcement will be gradual over the plan years.

T-1C: Adopt and implement a Complete Streets Ordinance.

Summary of specific issues: The City should adopt and implement a citywide Complete Streets ordinance. This ensures that all plans for street construction and reconstruction consider the needs of pedestrians of all ages and abilities, bicyclists, transit users, transit vehicles, and other non-automobile users.¹

Strategy/Action Plan: The policy should be reviewed by City planning staff, Traffic and Transportation staff, and regional stakeholders including Charleston County and the SCDOT before adoption and implementation by the City. Further, the City should encourage regional stakeholders to incorporate Complete Streets into regional plans.

Implementation responsibilities/ assignments: City staff should establish a liaison to work with regional stakeholders.

Regional partners for funding and implementation: Many regional partners are needed for funding as well as implementation. An initial list includes:

- BCDCOG – The regional Metropolitan Planning Organization has included

Complete Streets in the regional long range transportation plan, and has a Complete Streets budget to assist in funding eligible projects in the region.

- SCDOT - The state conducts restriping studies for municipalities within the traffic engineering division of the SCDOT. These studies are done at the request of policy makers on the municipal level.
- Charleston County RoadWise - The Charleston County Sales Tax program.

Benefits anticipated, aside from greenhouse gas reductions: Complete streets increases air quality, physical activity, and overall health; better serves the transportation needs of the elderly, handicapped, and children; reduces traffic congestion; reduces the cost of maintaining roads due to less use by heavy vehicles; and requires no additional funds for planning and engineering evaluation, since existing transportation funds can be used.

Timeline for implementation: City liaison with regional partners should establish initial meetings as soon as possible. Implementation will be visible to the public as soon as road improvements are complete.

On-going implementation will require vigilance on the part of the City's liaison with regional stakeholders, as transportation projects are constantly in progress. Through the County RoadWise program, the Charleston Area Transportation Study (CHATS) long range transportation plan, and County resurfacing projects, there are many projects where this policy can be implemented.

T-1D: Support employer-based programs that encourage alternative transportation.

Summary of specific issues: The City

should offer incentives to employees who use public transit and other SOV alternatives. The City should also support other employers willing to do the same.

Strategy/Action Plan: The City should first implement some or all of the following policies, then offer reduced taxes to other employers willing to do the same:

- Provide CARTA passes for employees at discounted rates
- Provide preferred or free parking for carpoolers/vanpoolers
- Offer bonuses to employees who use alternatives to SOVs
- Guarantee a ride home in case of emergency
- Eliminate free employee parking

Further, the City should educate employers about federal pre-tax benefits associated with transit use, and support mortgage rate incentives for homes purchased near public transit through permitting and public education.

Implementation responsibilities/ assignments: The City's Sustainability Director should work with other City staff and employer contacts in the region to implement this plan.

Regional partners for funding and implementation: State of South Carolina, SC DOT, CARTA, Tri-County Link, BCDCOG, Charleston Metropolitan Chamber of Commerce.

Cost to implement/net savings from implementation: Reduced City tax revenues and, potentially, reduced state fuel tax revenues if gasoline purchases decline. However, reduced use of SOVs reduces roadway maintenance costs. Further, increased SOV use could cause Charleston to exceed federal air quality standards, which would put federal transportation funding at

Recommendations

risk.

Benefits anticipated, aside from greenhouse gas reductions: Reduced traffic congestion; increased quality of life; and stronger community relationships as more residents commute together. Also, the region may experience an economic multiplier effect as gasoline savings shift toward purchases that provide higher profits for local residents.

Timeline for implementation: A community-wide template for implementation can be made available to all regional employers. Later, the success of City-based initiatives can spread to other municipalities in the region.

Recommendation T-1E: Encourage vehicle-free tourism.

Summary of specific issues: Since tourism is a central to Charleston's economy, the City should address the transportation demand created by visitors who use their own vehicles to enjoy the City's attractions. The City should create a plan to limit vehicle use by visitors.

Strategy/Action Plan: Strategies could include enhanced public transit, restriction of vehicle travel on certain streets, increased availability of bike rentals, expansion of green taxis and pedi-cabs, and affordable city-perimeter parking with frequent shuttle service. Also, the City should aggressively market these alternatives to visitors.

Implementation responsibilities/ assignments: Implementation should be coordinated by the City's Sustainability Director, in partnership with the CVB and the Hotel/Motel Association, who can help with the marketing campaign. Materials can

be distributed to hotel/motel concierges and on travel websites.

Regional partners for funding and implementation: BCDCOG's regional travel demand management program, SCDOT, the Governor's Council on Tourism and Travel, CARTA, Charleston Metro Chamber of Commerce, Tri-County Link. Also North Charleston Convention Center, Tanger Factory Outlets, Kiawah Island Resort, Wild Dunes Resort and Conference Center, and Charleston Visitors Bureau.

Cost to implement/net savings from implementation: The cost of marketing can be spread across stakeholders, including the tourist attractions themselves, the hotel/motel industry, and others in the tourism community.

Benefits anticipated, aside from greenhouse gas reductions: Charleston has many strengths: historic setting, access to the waterfront, excellent dining, and her beauty as a walking city. Reducing vehicles on our congested streets would make the city even more walkable than it already is. Marketing the City as a "Green" destination should be pursued as part of a cost-benefit analysis of this program. Consistent with bicycle, pedestrian, running, and other specialty tourism marketing campaigns, "eco-friendly" tourism has emerged as a strong selling point for environmentally-conscious travelers looking to reduce their carbon footprint.

Timeline for implementation: Implementation can reasonably be expected by summer 2010.

T2. INCREASE CONVENIENT, RELIABLE PUBLIC TRANSPORTATION

T-2A: Support collaborative programs that encourage the use of public transit.

Summary of specific issues: The City should strengthen already strong partnerships with CARTA and Tri-County Link, working together to encourage the use of public transit.

Strategy/Action Plan: Strategies should include the following:

- **Require CARTA bus stops and sheds within new developments and redevelopments along current and proposed CARTA routes:** Staff should create an inventory of current CARTA stops, distance between stops and frequency of bus lines to overlay with new/redeveloped residential neighborhoods. Determination of route adjustments and additions should be based on an equidistant measurement between bus stops. The inventory should be GIS-based and should cover all streets presently serviced by CARTA. Provision of “park and ride” lots may be a viable alternative should neither CARTA nor Tri-County Link provide service in close proximity to these development projects.
 - **Establish public and private partnerships to increase transit ridership:** CARTA and Tri-County Link already have ridership programs involving large regional employers such as MUSC and College of Charleston. Employers of all sizes should also be asked to participate. The Sustainability Director should designate a liaison to help CARTA market this program to Charleston business owners.
 - **Make public transport more visible and inviting, including additional lighting**
- to enhance safety:** Relatively few people use public transit in Charleston, perhaps because the system has a poor public image – particularly bus service. Many bus stops have no seating, substandard seating, lack rain cover, lack litter control and/or have poor landscaping. Modest investment in waiting area upgrades will put a professional “face” on Charleston’s primary public transit system. While the provision of these facilities is the responsibility of CARTA, the City of Charleston should help improve transit service in the City. The City should create a plan to improve the stops, including solar-powered lighting, benches, rain covers, and trash and recycling receptacles. The City should consider an “adopt-a-stop” program for volunteers, similar to Adopt-a-Highway programs. The City may also wish to consider special “transit teams”, made up of police, trash removal and Parks and Recreation staff to monitor waiting areas on a scheduled basis.
- **Support the creation of bilingual CARTA route programs over the next 15 years:** All CARTA information should be available in both English and Spanish. This should include CARTA’s website, route maps, on-board signage, and bus stop signage, and should also include bilingual drivers and help-line associates. Further, the Charleston Visitors Bureau may identify other languages of significance for this program, depending on what percent of visitors speak foreign languages.

Implementation responsibilities/ assignments: The Sustainability Director should create an action plan to implement these recommendations, including identification and pursuit of funding sources. In most cases, identifying a City liaison to regional transit agencies will

Recommendations

suffice, but higher-level City involvement may be necessary to ensure that the City effectively influences regional transit planning efforts.

Regional partners for funding and implementation: See above.

Benefits anticipated, aside from greenhouse gas reductions: Improved air quality; improved public health from walking to public transit stops; reduced traffic congestion; and a stronger sense of community from sharing transportation, and improved quality of life.

Timeline for implementation: This action can begin upon approval from City Council.

Recommendation T-2B: Show visible support for public transit through the location of city events and public service facilities.

Summary of specific issues: The City should locate meetings, events, and public service facilities where people can easily access them using public transit. Public service facilities include, for example, hospitals, libraries, post offices, homeless shelters, and community centers,

Strategy/Action Plan: Strategies include the following:

- **Continue to advertise CARTA routes for City meetings and events:** Establish a City policy stating that meeting and event sites should be within a five minute walk of CARTA or Tri-County Link route stops. Also, the City Office of Public Information should continue to include public transit information in advertisements for all public events.

- **As public service facilities are planned, relocated, or scheduled for retrofit, proximity to public transit should be a priority as decisions are made about location.**

Implementation responsibilities/ assignments: The Sustainability Director should create an action plan to implement these recommendations.

Regional partners for funding and implementation: CARTA and Tri-County Link should both be included in efforts to provide public transit to public services facilities.

Benefits anticipated, aside from greenhouse gas reductions: Equal access to city functions and facilities for those who do not use an SOV is a significant public benefit.

Timeline for implementation: These recommendations can be implemented immediately at no additional cost to current operations.

T3. EXPAND BICYCLE AND PEDESTRIAN OPTIONS

Recommendation T-3A: Adopt and implement a City bicycle and pedestrian plan.

Summary of specific issues: Bicycle and pedestrian mobility are key elements of a sustainable transportation network. Bicycle and pedestrian travel already account for more than 6% of all trips to work in the City of Charleston.² Many areas of the City, such as the downtown area, provide safe travel for cyclists and pedestrians. However, many suburban areas have inadequate facilities.

Strategy/Action Plan: The City should

develop a plan to promote bicycle and pedestrian transportation and recreation throughout the City and beyond. The plan, which should be developed with community involvement and input from appropriate local and state agencies, should specify how to develop convenient access and ensure safety within an integrated, connected network of streets, trails and other transit corridors. Further, the plan should complement the Charleston Area Transportation Study (CHATS) long range plan and the BCDCOG Regional Transportation Plan. City Council should adopt this plan, including specific, actionable items.

A key element of this plan should be a funding and implementation strategy. Funding for construction and maintenance of new transportation facilities is one of the biggest challenges municipalities face. Our goal is to have a dedicated account funded annually through City revenue for bicycle- and pedestrian-related improvements, with reasonable limitations placed on eligible users and the amount and types of expenditures. Ideally, the fund would support multiple smaller projects rather than partially funding just a few larger projects.

Implementation responsibilities/ assignments: Development of the plan is the responsibility of the City's Planning, Preservation & Sustainability (PPS) Department. Implementation should involve all departments on some level but especially the following departments: Traffic and Transportation, Parks Department, Public Service Department and Recreation Department.

One of the main goals of the plan will be to integrate the process of planning for bicycles and pedestrians into every planning decision or project construction. The plan should also be integrated into the City's

overall comprehensive plan with an emphasis on the strong connection between land use and transportation. The Mayor and City Council will be involved in adopting the plan and approving policies and funding.

Regional partners for funding and implementation: The City should work closely with SCDOT, Charleston County and CHATS to ensure that projects are appropriately funded and major projects are included in their respective plans.

Cost to implement/net savings from implementation: The costs of a comprehensive bicycle and pedestrian plan include both the up-front costs of developing the plan and the costs of implementation over time. The plan may cost between \$50,000 and \$100,000 while recommendations such as zoning or City code changes cost virtually nothing. The highest costs should be those associated with facility improvements such as path construction or bike lane striping. If combined with road improvements or new construction, these elements should become a modest component of those projects.

Much of the savings associated with implementing a bicycle and pedestrian plan will occur much later when congestion and road wear are reduced by increased walking and bicycling. Also, road construction costs may decrease as a result of building pedestrian-scale streets with less width and less associated drainage infrastructure.

Benefits anticipated, aside from greenhouse gas reductions: Increased air quality, better public health through increased physical activity, reduced traffic congestion, enhanced recreational opportunities, better quality of life.

Timeline for implementation: Funding for a bicycle and pedestrian plan may be included in the budgeting process for the fiscal year following adoption of this recommendation.

Recommendations

The development of the plan may then take 6 months and adoption may occur soon thereafter. By the end of 2010, a local plan should be adopted and implementation underway.

T-3B: Restripe corridors for bicycle use.

Summary of specific issues: Once outside the Charleston peninsula, most streets connecting neighborhoods are multi-lane, high-speed corridors that provide no accommodations for bicycling. The City has the option of restriping certain roads to create on-street bicycle lanes. Hundreds of cities in the U.S. have used this strategy to create a network of safe, convenient bicycle routes. SCDOT, the Charleston Area Transportation Study (CHATS) Committee, and Charleston County all employ a process for road resurfacing that could easily include such restriping for a minimal increase in costs. Restriping may also include “sharrows,” or shared lane markings, which reinforce correct bicycle direction and indicate exactly where bicycles should travel inside a lane.

Strategy/Action Plan: The City should first study its roads to determine those appropriate for restriping. This may be done by either staff or a consultant. To streamline costs and provide consistency, the study may also be done as part of an overall City Bicycle/Pedestrian Plan. The City should then prioritize projects and obtain funding through federal enhancement grant funding, State C-funds (transportation-related funds distributed at the county level), City revenue, or other private or public grant sources.

Implementation responsibilities/ assignments: The City may initiate a partnership with Charleston County or CHATS because the most likely roads for restriping are major corridors that impact

multiple jurisdictions. The Traffic and Transportation Department, Public Service Department (Engineering Division and Streets & Sidewalks Division) and the Planning Division should be involved. It may be helpful to designate a staff member as a liaison to SCDOT and Charleston County resurfacing programs. The City may also need to apply for funding.

Regional partners for funding and implementation:

- CHATS Committee - this regional transportation planning entity prioritizes projects that receive federal funding. It also distributes federal enhancement grant funding and a regional ‘Complete Streets’ fund.
- Charleston County - the County maintains a county-wide road resurfacing schedule through in which all jurisdictions participate. The City should work closely with the County to ensure that restriping happens when a road is resurfaced. The County also may approve funding for some projects from the ½ cent transportation sales tax.

SCDOT - The State maintains most of the major corridors in Charleston and must approve all restriping plans. In cities around the state, the SCDOT has conducted traffic engineering and design needed to restripe highways.

Cost to implement/net savings from implementation: In the overall cost of road construction or road resurfacing, striping is negligible. It is an option to request that SCDOT do the necessary engineering in-house at little to no cost to the City. The per-mile cost estimates widely reported range between \$5,000 and \$14,000 including engineering, labor, paint, signage and signals.

Benefits anticipated, aside from

greenhouse gas reductions: Increased air quality, better public health through increased physical activity, reduced traffic congestion, enhanced recreational opportunities, better quality of life.

Timeline for implementation: The recommendation for a restriping plan may be implemented concurrently with other efforts to increase bicycling by creating a comprehensive network. The City is working on an action plan to become a Bicycle Friendly Community and restriping for bike lanes is one of the many items to be implemented. The City may be able to identify some funding and formalize a process for working with the partnering agencies immediately, resulting in a coordinated schedule with Charleston County for resurfacing within the City.

T-3C: Acquire “Bicycle Friendly Community” status.

Summary of specific issues: A Bicycle Friendly Community, as defined by the League of American Bicyclists, is one where cycling is prevalent and supported by the community. Charleston can achieve this designation by meeting certain criteria - for example, a network of bicycle facilities and a certain level of educational and promotional programs. Charleston already has the climate, terrain and physical attractions to provide a great cycling environment and has been gradually improving its bicycle accessibility. Efforts are underway to achieve this prestigious designation.

Strategy/Action Plan: The first thing a Bicycle Friendly Community (BFC) needs is an action plan. A BFC task force has been formed by the Mayor to formulate an action plan. This plan includes:

- Adopting a target
- Creating a network of bicycle routes, paths and lanes throughout the entire

community

- Establishing information programs to promote cycling and its benefits
- Encouraging employees to commute or conduct work using a bicycle
- Ensuring plans, policies and codes meet the needs and goals of creating a bicycle friendly community
- Educating bicycle users on the rules of the road and safe interaction with other vehicles and pedestrians
- Enforcing traffic laws to increase safety for all users of the roads
- Promoting intermodal travel by allowing bikes on buses or trains and establishing bike parking at transit stops
- Ensuring City staff have the training available to implement bicycle plans/projects

Once a plan is underway, the task force should complete the application process to the League of American Bicyclists.

Implementation responsibilities/ assignments: Achieving BFC status will be a community-wide effort led by City elected officials and staff. The newly formed BFC task force includes stakeholders from various areas of the City, bicycle-related organizations, and all relevant City departments. The task force is responsible for creating a BFC action plan and submitting an application. Five task force sub-groups are responsible for completing section of application related to Engineering, Encouragement, Education, Enforcement and Evaluation.

Regional partners for funding and implementation: Many of the educational and promotional programs can be accomplished on a regional basis through BCDCOG, while infrastructure improvements rely heavily on projects approved through the SCDOT, CHATS or Charleston County programs.

Cost to implement/net savings from

Recommendations

implementation: Costs associated with policy and zoning codes will be minimal. Community stakeholders will get involved in educational and promotional programs for very little cost. Costs also include those related to bicycle facilities, which will be incurred on a project by project basis. Cost savings include reduced costs for auto infrastructure; for example, fewer parking facilities or replacing some city motor vehicles with bicycles. Financial benefits include more tourism dollars, increased property values and increased bicycle sales.

Benefits anticipated, aside from greenhouse gas reductions: Stronger marketing for tourism, increased air quality, better public health through increased physical activity, reduced traffic noise and congestion, enhanced recreational opportunities, better quality of life.

Timeline for implementation: This recommendation is already underway with a goal of receiving “bronze level” designation in the next 18 months. After Charleston receives the BFC designation, the City should continue to implement and evaluate our goals. The process will move from focused efforts to sustained processes through community groups and City departmental planning and decision-making.

T-3D: Provide incentives for City employees to commute or conduct business using bicycles.

Summary of specific issues: Bicycles provide efficient, cost-effective transportation. The City should provide incentives for employees to commute or conduct business via bicycle.

Strategy/Action Plan: The City already gives employees subsidized CARTA bus passes. This program could expand to include a similar benefit for bicycle

commuters. Business employee bicycle subsidies of up to \$20 per month are tax exempt.³

Another way to promote bicycle commuting is to provide shower or changing facilities. City staff can work to identify potential locations in City offices or recreation buildings, or contract with off-site health clubs for showers and locker rooms.

The City may also provide bicycles as an option for some work-related vehicle trips. Incentives may be needed to encourage the purchase and use of bicycles by appropriate Departments. Note: when police recover bicycles and their owners cannot be found, the City now makes them available for conducting City business.

Implementation responsibilities/ assignments: The purchase of City bicycles should be the responsibility of individual departments. The City’s Department of Human Resources and Organizational Development can implement the bicycle subsidy. The City’s Property Manager should be instrumental in identifying shower/locker facility locations.

Regional partners for funding and implementation: Partners may include community groups that sponsor programs or provide grants for purchasing bicycles or maintenance equipment. CARTA could be involved with an effort to combine transit passes with a bicycle subsidy, since most CARTA buses have bike racks for longer-distance commuters.

Cost to implement/net savings from implementation: Costs include purchase and maintenance of bicycles and facility upgrades for showers. Potential cost reductions include City-subsidized employee parking, motor vehicle purchase and maintenance, and costs associated with employee health as employees become

more active.

Benefits anticipated, aside from greenhouse gas reductions: The City could inspire other employers/employees to increase the use of bicycles, reducing traffic congestion and noise pollution.

Timeline for implementation: Incentive and employee benefit programs may be studied within the next 8 months and policies in place within the next 12 months.

T4. INCREASE FUEL EFFICIENCY AND USE OF BIOFUELS

T-4A: Set high standards for the purchase, use, and maintenance of City vehicles.

Summary of specific issues: Despite price fluctuations up to \$4 per gallon in August 2008, and despite alternatives entering the marketplace, the United States still relies on petroleum for 97% of the fuel for cars, buses, trucks, trains, planes, and ships.⁴ At the very least, the City's own fleet should be moving toward greater fuel efficiency and the use of cleaner fuels.

Strategy/Action Plan: Short-term action items should include the following:

- Quantify fuel economy for different classes of City vehicles, which could include passenger, light-truck, truck, bus, and off-road.
- Implement DHEC anti-idling education for City staff and partner organizations.
- Consider the total lifecycle costs, including maintenance, insurance, and resale value, of hybrid, plug-in hybrid, battery electric, and biofuel vehicles.
- Analyze cost/benefit for "plug-in" facilities at City garages.

- Consider delaying procurement when a cost-effective, more fuel-efficient vehicle will be available within two years.
- Add fuel inefficiency as a priority consideration when retiring fleet vehicles.
- Where funding and return-on-investment permits, retrofit City vehicles and equipment with alternative fuels or emissions filters.
- Encourage the use of bicycles, mopeds, motorcycles, and electric vehicles where appropriate.
- Meet the LEED standard for City garages by implementing one of the following LEED options:
 - ◇ Provide low-emitting and fuel-efficient vehicles for 3% of Full-Time Equivalent (FTE) occupants and provide preferred parking for these vehicles.
 - ◇ Provide preferred parking for low-emitting and fuel-efficient vehicles for 5% of the total vehicle parking capacity of the site.
 - ◇ Install alternative-fuel refueling stations for 3% of the parking capacity of the site (liquid or gaseous fueling facilities must be separately ventilated or located outdoors.)

Low-emitting and fuel-efficient vehicles are defined as vehicles that are either classified as Zero Emission Vehicles (ZEV) by the California Air Resources Board or have achieved a minimum green score of 40 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide.

Long-term action items are as follows:

Recommendations

- After a majority of short-term action items have been implemented, set a fuel reduction goal (a certain percent over a certain amount of time) for the City.
- Engage the City's electric utility provider and encourage grid improvements and other infrastructure improvements needed to reap the benefits of plug-in vehicles.
- Coordinate with City Fleet Management to develop a schedule for vehicle retirement and a strategy for funding this process.

Implementation responsibilities/ assignments: Most of the action items listed above should be carried out by City Fleet Management, Planning, Preservation and Economic Innovation, and Traffic and Transportation.

Regional partners for funding and implementation: State and regional partners include:

- BCDCOG
- SCDOT
- South Carolina Department of Health and Environmental Control (SCDHEC)

Benefits anticipated, aside from greenhouse gas reductions: Improved air quality, reduced dependence on foreign oil, and an injection of capital into local economies.

Timeline for implementation: The initial inventory of vehicle fuel efficiency along with implementation of short-term action items can begin immediately, in 2009, and be measured annually thereafter. Long-term action items can be implemented as technology, funding, and best practices permit.

T-4B: Support reduction of

emissions from freight-related trucks, trains, and ships.

Summary of Specific Issues: The Charleston area is home to a thriving ocean port, as well as local industry. Transportation of freight generates significant truck, train, and ship traffic. The City should support significant reductions in emissions from this traffic.

Recommendation/Strategy/Action Plan: While most vehicle use and maintenance is outside the City jurisdiction, the City should identify opportunities to influence key decisions. The following strategies should be included:

- Decrease congestion of freight corridors to improve freight travel times;
- Move freight more fuel efficiently, or using cleaner fuels; and
- Reduce unnecessary idling by ships, trains and trucks;

Implementation Responsibilities/ Assignments: The City's Sustainability Director should identify opportunities for City involvement in this issue.

Regional Partners in Implementation: The City should form partnerships with the following to have a constant presence on technical working groups, steering committees, and other groups with policy making and implementation:

- South Carolina State Ports Authority
- BCDCOG (Neck Area Transportation Master Plan, CHATS Long Range Transportation Plan)
- SCDOT (Corridor Planning)
- SC Trucking Association
- DHEC (Air Quality initiatives)

Cost to Implement/Net Savings from Implementation: The cost to implement may be limited to the time spent working as meeting participants.

T-4C: Support strict enforcement of speed limits.

Summary of specific issues: According to the federal EPA, speeding, rapid acceleration, and rapid braking can lower gas mileage by 33% at highway speeds. Simply observing the speed limit can result in up to a 23% increase in fuel economy.⁵ For these reasons, CECAC recommended stricter speed enforcement, targeting vehicles traveling 5 mph or more over the speed limit on highways with speed limits of 55 mph or more. This will reduce emissions through improved fuel efficiency in both light- and heavy-duty vehicles.

Strategy/Action Plan: The City should participate in any statewide public information campaigns that support this CECAC recommendation.

Implementation responsibilities/ assignments: Sustainability staff should keep abreast of state plans for a public information campaign. The Sustainability Director should coordinate staff from the office of Planning, Preservation and Economic Innovation, the department of Traffic and Transportation and the Public Information Office.

Regional partners for funding and implementation: Partners may include SCDOT and BCDCOG.

Benefits anticipated, aside from greenhouse gas reductions: Improved fuel economy and increased safety.

Timeline for implementation: Staff from the Sustainability Division can immediately begin to monitor the status of CECAC policy recommendation TLU-8. The City's actual participation will depend on the timeline of a statewide program.

T-4D: Study the benefits of providing free or preferred parking for high efficiency vehicles on City and County lots and decks.

Summary of specific issues: Hybrid and alternative-fuel autos, which reduce greenhouse gases and other emissions, are gaining traction in the marketplace. Cities across the nation are helping to promote this trend by providing free or preferred parking to these vehicles. Such programs help offset increased costs to consumers purchasing such vehicles; promote awareness about hybrid and biofuel technology; and offer an incentive to prospective buyers of hybrid, biofuel, and other high-fuel efficiency autos.

Strategy/Action Plan: The City should explore ways to help promote purchase of high-efficiency vehicles, including the provision of free or preferred parking on lots or decks owned by the City and County. The City should evaluate what aspects of these programs are appropriate for Charleston and recommend any innovations appropriate for Charleston.

Implementation responsibilities/ assignments: The Sustainability Director should coordinate with Traffic and Transportation staff to conduct the study and, if advisable, create an implementation plan.

Regional partners for funding and implementation: Charleston County may have useful information to contribute, and coordination with the County will be essential if implementation includes County-owned facilities.

Benefits anticipated, aside from greenhouse gas reductions: Increased air quality and enhanced public health.

Recommendations

Timeline for implementation: The initial study can begin immediately, followed by an implementation plan and implementation.

T-4E: Improve vehicle flow by using transportation system management.

Summary of specific issues: The efficient flow of traffic through the City of Charleston is vital in increasing fuel efficiency and reducing emissions. The idling of cars on congested roadways results in the unnecessary release of tons of hydrocarbons, nitrous oxide, and carbon monoxide.

Strategy/Action Plan: The City of Charleston completed a traffic signal sequencing plan in 2008 which reduced travel times on 15 of Charleston's major travel routes during peak commuting hours by approximately 9%. This reduction should prevent consumption of more than 240,000 gallons of gasoline annually, as well as emission of associated greenhouse gases. To maintain the effectiveness of traffic signal coordination, sequencing and retiming should be reevaluated every 5-10 years.

Vehicle flow could be improved further by using high occupancy vehicle (HOV) lanes; roundabouts instead of stop signs and traffic signals; and variable message signs to direct traffic around congestion. Another strategy would be to encourage local businesses and agencies to adopt alternate working hours. (Note: improved public transit is ultimately the most effective way to reduce traffic and harmful emissions.)

Implementation responsibilities/ assignments: Most primary commuter routes are under state jurisdiction. Therefore, it will be necessary for SCDOT to fund and

implement HOV lanes, intersection redesigns, and variable message signs. SCDOT will also need to grant permission for these modifications. Also, funding to reevaluate traffic signal sequencing is the responsibility of SCDOT. The City should do what it can to encourage and assist.

Regional partners for funding and implementation: In addition to SCDOT, such changes can be incorporated into BCDCOG's long range transportation plan, thereby qualifying to receive BCDCOG funds.

Benefits anticipated, aside from greenhouse gas reductions: Increased fuel efficiency; increased air quality; small changes in commute time with significant aggregate effect.

Timeline for implementation: HOV lanes and intersection redesigns can be costly, and will probably be considered primarily when highways are being widened or otherwise improved. On the other hand, identification of locations which would benefit from variable message signs could begin immediately. Obtaining agreement and funding from SCDOT for such signs will likely require persistent and frequent communication. Retiming and optimal sequencing of traffic signals was completed in 2008, and should be reevaluated between 2013 and 2018.

T-4F: Support anti-idling programs and technologies.

Summary of specific issues: Extended idling can be a significant contributor to air pollution. Near a school, idling vehicles can have an even stronger negative impact because of the proximity to children and pedestrians. School children engage in a high level of outdoor activity (athletics, bands, etc.) which makes them particularly vulnerable to pollution.

Strategy/Action Plan: Reduce idling near all city schools by using DHEC's existing B2, Breathe Better education program. Educational programs can be conducted within schools, and appropriate signage added to other problem areas such as loading zones and bus stops. The City should enforce its existing idling ordinance.

Implementation responsibilities/ assignments: Partnering with the City Information Office, the Traffic and Transportation Department, and the police force, the Sustainability Director should identify opportunities for anti-idling policies and education.

Regional partners for funding and implementation: Primarily DHEC.

Cost to implement/net savings from implementation: This program can cost the City next to nothing. DHEC manages state-funded education and compliance programs.

Benefits anticipated, aside from greenhouse gas reductions: Improved air quality and enhanced public health. Cleaner air near schools will benefit children, teachers, and staff.

Timeline for implementation: Partnerships with DHEC and other agencies can be established in 2009. Development of additional programs and educational outreach will be on-going.

T-4G: Research a property tax assessment on vehicles that is based on emissions rather than value.

Summary of specific issues: Vehicles emitting more carbon dioxide have a greater impact on the air that citizens breathe. Communities that are in non-

attainment of federal air quality standards will be required to initiate programs that reduce emissions from vehicles. The Charleston metropolitan area is very close to this non-attainment level. Research should be conducted of the rationale and the feasibility of the state of South Carolina taxing a vehicle based on its emissions. The tax could be based on the miles-per-gallon ranking for each type of vehicle. If implemented, this strategy could be phased in over time with advance notice to allow more efficient vehicles to be on the market and to allow more informed purchasing of vehicles. This will help promote the popularity of high-efficiency vehicles, thereby lowering greenhouse gas emissions.

Strategy/Action Plan: State legislation would be required to enable such a tax. Once this legislation is in place, the City can work with the County to develop the tax. Coordination and public support should be maintained throughout the process, and should continue after implementation in case any changes need to be made.

Implementation responsibilities/ assignments: The Sustainability Director should spearhead this effort.

Regional partners for funding and implementation: Charleston County and the General Assembly, as well as civic organizations and non-profits.

Benefits anticipated, aside from greenhouse gas reductions: Increased air quality; enhanced public health; increased energy independence; increased community resilience to fluctuations in the price of oil.

Timeline for implementation: Initial research and outreach can begin immediately, engaging County and local community to obtain necessary support. Before the beginning of the next legislative session, General Assembly members should

Recommendations

be engaged as well.

T-4H: Support purchase, use, and appropriate maintenance of high-efficiency vehicles for the CARTA fleet.

Summary of specific issues: Buses present many fuel efficiency and emission challenges. Solutions enter the market with every new bus design. However, as buses last ten to twenty years, the most immediate improvements would result from retrofits to the existing fleet.

Strategy/Action Plan: City staff should appoint a liaison to help CARTA and Tri-County Link pursue federal and state grant opportunities. Tasks should include the following:

- Regularly research advances in the technology of alternative fuels, such as biodiesel, compressed natural gas, propane injection, etc.
- Regularly research advances in the technology of pollution control devices such as diesel filtration, oxidation converters, etc.
- Regularly compare the lifecycle costs and benefits of retrofitting buses in the existing fleet.

Implementation responsibilities/ assignments: The Sustainability Director or City Fleet Management should designate an appropriate liaison.

Regional partners for funding and implementation: CARTA, Tri-County Link, and BCDCOG, which facilitates of federal funding for local transit providers.

Benefits anticipated, aside from greenhouse gas reductions: Improved air quality, reduced dependence on foreign oil, and an injection of capital into local economies.

Timeline for implementation: The partnership and grant assistance should begin immediately.

T5. IMPROVE AIR QUALITY

T-5A: Reduce emissions from small-motor equipment.

Summary of specific issues: Small gasoline-powered motors account for a disproportionate amount of air pollution compared with other petroleum-fueled motors. Reductions in pollution from lawn equipment should not only improve overall air quality, but should also improve air quality in localized residential areas.

Strategy/Action Plan: The City should continue working with DHEC and other local governments and private entities to promote voluntary lawnmower exchange programs. This recommendation overlaps with the recommended procurement program, supporting the purchase and use of lower emissions equipment by the City of Charleston.

Implementation responsibilities/ assignments: The City of Charleston should participate through the Sustainability Office in the Lowcountry Lawnmower Exchange programs.

Regional partners for funding and implementation: DHEC, Sustainability Office, Charleston County Recycling.

Cost to implement/net savings from implementation: Lawnmower exchange programs can occur with little or no monetary support from the City.

Benefits anticipated, aside from greenhouse gas reductions: Noise pollution

will be reduced by the increased use of the quieter, electric mowers.

Timeline for implementation: The first lawnmower exchange program took place in March 2009.

T-5B: Raise public awareness of the need to reduce air pollution outdoor burning and emissions from inefficient, outdoor wood-burning stoves. Educate the public on the existing laws and available cleaner-burning technologies and materials.

Summary of specific issues: Existing state and local laws already limit outdoor burning. Pollution from burning yard debris burning and from wood stoves degrades air quality in residential areas and can lead to respiratory problems for sensitive people, such as those with asthma.

Strategy/Action Plan: Burning yard debris is prohibited, but enforcement needs to be improved. Also, outreach campaigns could spread the word about the adverse affects of open burning, alternative methods for disposing yard debris, and the benefits of using clean-burning wood stoves. Effective forms of outreach include press releases and direct contact with neighborhood associations.

Implementation responsibilities/ assignments: City staff, including the Fire Department.

Regional partners for funding and implementation: DHEC could assist by participating in neighborhood association meetings or contributing air quality data.
Benefits anticipated, aside from greenhouse gas reductions: Improved air

quality, especially in localized areas, and improved fire safety.

Timeline for implementation: Programs can be identified by summer 2010, and initiated by the end of 2010.

Improved Transportation

1. See "Growing Cooler: The Evidence on Urban Development and Climate Change," Urban Land Institute 2007), at 4, <http://www.smartgrowthamerica.org/documents/growingcoolerCH1.pdf>.
2. *Id.* at 2, 4. *Id.*
3. *Id.* at 4.
4. See "A New Vision for the 21st Century," AASHTO (2007), summarized at <http://www.transportation.org/news/121.aspx>. *Id.*
5. See "Growing Cooler: The Evidence on Urban Development and Climate Change," Urban Land Institute (2007), at 4, 7, <http://www.smartgrowthamerica.org/documents/growingcoolerCH1.pdf>.
6. See "Outer Limits: Sprawling Atlanta Seeks New Routes to the Future," *Grist* (14 May 2008), <http://www.atlanticstation.com/press/Sprawling%20Atlanta%20seeks%20new%20routes%20to%20the%20future%20|%20By%20Robert%20DiGiacomo%20|%20Grist%20|%20Grist%20Feature%20|%2014%20May%202008.pdf>.
7. See "Fast Track for Commuter Rail," *Post & Courier* (14 March 2008), http://www.postandcourier.com/news/2008/mar/14/fast_track_commuter_rail33776/.
8. See "Ridership Ahead of Schedule," *Charlotte Observer* (12 July 2008), <http://www.charlotteobserver.com/local/story/76813.html?q=light%20rail%2016,479>. See "Charlotte Light Rail Line Exceeds First-Year Ridership Goals," *Smart Growth News* (2009) <http://www.smartgrowth.org/news/article.asp?art=7208&res=1280>.
9. See "Charlotte Light Rail Line Exceeds First-Year Ridership Goals," *Smart Growth News* (2009) <http://www.smartgrowth.org/news/article.asp?art=7208&res=1280>.
10. See "Charlotte's New Lynx Light Rail," *Light Rail Now* (2008), http://www.lightrailnow.org/news/n_cha_2008-08a.htm.
11. *Id.*
12. See "Light Rail in Charlotte," www.Joe Urban.com (2009), <http://joe-urban.com/wp-content/uploads/2009/08/light-rail-in-charlotte-july-20091.pdf>.
13. See, e.g., "South End Development Fits Transit-Oriented Plan," *Charlotte Observer* (20 July 2008), <http://www.charlotteobserver.com/opinion/story/85469.html?q=light%20rail%20%22transit%20oriented%22>; "Rezoning Requests to be Considered," *Charlotte Observer* (14 Sept 2008), <http://www.charlotteobserver.com/277/story/175039.html?q=light%20rail%20%22transit%20oriented%22>.
14. See "Light Rail in Charlotte," www.Joe Urban.com (2009), <http://joe-urban.com/wp-content/uploads/2009/08/light-rail-in-charlotte-july-20091.pdf>.
15. See "State of the Air 2007," American Lung Association, at 6, http://www.lbamspray.com/00_Health/American%20Lung%20Association.pdf.
16. See "Physicians are Concerned about Dangers of Air Pollution," *Post & Courier* (2 July 2008), <http://www.postandcourier.com/news/2008/jul/02/>

[physicians are concerned about dangers air polluti/](#); Charleston County Medical Society resolution confirmed by e-mail with staff Kaye Wallen on 28 Sept 2009.

Improved Transportation Recommendations

1. See www.completestreets.org.
2. Census 2007 American Community Survey.
3. http://www.irs.gov/publications/p15b/ar02.html#en_US_publink1000101852
4. www.hybridcars.com/oil-dependence
5. <http://www.fueleconomy.gov/feg/driveHabits.shtml>
6. LEED Category - Sustainable Sites - 4.3

Zero Waste

1. See "Trash Strategies Approved," *Post & Courier* (2 Sept 2009), <http://www.postandcourier.com/news/2009/sep/02/trash-strategies-approved/>.
2. *Id.*
3. See "Waste Management 2008 Rankings," [www.SustainLane.com](http://www.sustainlane.com), <http://www.sustainlane.com/us-city-rankings/categories/waste-management>.
4. "California Reports 58 Percent Waste Diversion," *Recycling Today* (8 Jan 2009); <http://www.recyclingtoday.com/news/news.asp?ID=14485>; "Maryland's 47.5 Percent Diversion Rate," Maryland Department of the Environment (2007), <http://www.mde.maryland.gov/Programs/LandPrograms/Recycling/Local/recyclingrates.asp>.
5. See "Safeway's Waste Diversion Rate: 85 Percent," www.GreenBiz.com (14 May 2009), <http://www.greenbiz.com/news/2009/05/14/safeways-waste-diversion-rate-85-percent>; "Waste and Recycling," Global Citizenship at HP (2009), <http://www.hp.com/hpinfo/globalcitizenship/gcreport/operations/waste.html>.
6. See "10 Fixes for the Planet," *Newsweek* (14 April 2008), <http://www.newsweek.com/id/130625/page/1>.
7. "Atlanta to Launch Southeast's First Zero Waste Zone," *U.S. Environmental Protection Agency* (12 Feb 2009), <http://yosemite.epa.gov/opa/admpress.nsf/2ac652c59703a4738525735900400c2c/4f7604c1b53aa8cd8525755b00781318?OpenDocument>.
8. See "What's Your Take on Zero Waste?" *Austin City Connection*, <http://www.ci.austin.tx.us/sws/0waste.htm>; "A Resolution Supporting the Creation of a Zero Waste Plan," Grassroots Recycling Network (1998), <http://www.grrn.org/zerowaste/CZWRes.html>.
9. See "Pay as You Throw (PAYT) in the U.S.: 2006 Update and Analyses," U.S. Environmental Protection Agency Office of Solid Waste (2006) at 1 <http://www.epa.gov/waste/conserves/tools/payt/pdf/sera06.pdf>.
10. See "Pay as You Throw (PAYT) in the U.S.: 2006 Update and Analyses," U.S. Environmental Protection Agency Office of Solid Waste (2006) at 1 <http://www.epa.gov/waste/>



