

# Toward Healthier Living

Strategies to Make Active Living and Healthy Eating  
a Part of Life in Knoxville and Knox County





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# Executive Summary

**Obesity, particularly among our young population, has reached epidemic proportions.**

Tennessee ranked behind only Mississippi, Alabama and West Virginia in the adult obesity rate at 30.2%, and ranked fifth in the childhood obesity rate at 36.5% in a recent study. Knoxville and Knox County are no different than the balance of the state.

**Neighborhoods designed for active living and healthy eating provide greater opportunities for the residents of Knoxville and Knox County to get fit, eat right and stay healthy.**

The benefits of active living and healthy eating extend beyond the health of our population to include equity, sustainability and protection of community values and personal property.

**The manner in which subdivisions are designed, neighborhoods are developed and community infrastructure is improved play a significant role in allowing a way of life that incorporates active living and healthy eating.**

Street systems, sidewalk and greenways networks, connections to parks, open space, and schools, local agriculture and community gardens are important pieces of community infrastructure that promote healthy living.

**To promote active living, communities should make it easy and safe to walk and bike.** There must be a system of highly connected streets with sidewalks and greenways that are convenient, comfortable and connected to the places people want to go to:

neighboring friends, parks, schools, stores and shops, and work places.

**To promote healthy eating, communities should preserve and protect local agriculture, and allow communities to grow and distribute garden produce anywhere by everyone, as individuals on their own property or as a community on a shared piece of ground.** After garden produce is grown, the community should be capable of selling or sharing the produce.

The Knoxville and Knox County plans, policies, subdivision regulations and zoning ordinances need significant changes to promote active living and healthy eating in their subdivisions, neighborhoods, and communities.

**City and County policies need to reflect the importance of active living and healthy eating.** Policies and plans should be adopted regarding pedestrian and bicycle mobility, complete streets, traffic calming, street connectivity and park land dedication.

City and County capital improvement plans need to allocate sufficient funds to make the improvements necessary to modify our communities to promote active living and healthy eating. Annual and long term capital improvement plans should be adopted that reflect a commitment to improving streets, pedestrian and bicycle facilities, parks and utilizing traffic calming methods.

### **The Knoxville–Knox County Subdivision**

**Regulations** should be amended to require as a part of the subdivision process the provision of infrastructure that supports active living and healthy eating. The subdivision regulations should be amended to:

- **Increase and improve pedestrian and bicycle facilities and adopt minimum standards to increase pedestrian and bicyclist safety and comfort;**
- **Require streets to be constructed in accordance with complete street standards to provide safe places for pedestrians, bicyclists and transit users;**
- **Require traffic calming measures be included in streets when appropriate to slow traffic and improve pedestrian and bicyclist safety and comfort;**
- **Require street, sidewalk and greenway connectivity to enhance pedestrian and bicyclist use; and**
- **Require park and open space land dedication in accordance with adopted policies to increase the opportunities for activity within neighborhoods.**

### **The Knoxville and Knox County Zoning**

**Ordinances** should be amended to allow the development of mixed-use communities that are walkable and connected to transit and preserves and protects local agricultural resources while expanding the opportunities for urban agriculture. The City and County zoning ordinances should be amended to:

- **Allow more mixed-use development, particularly along arterial corridors and transit routes to reduce the need for automobile use and increase pedestrian and bicyclist activity;**
- **Amend parking requirements to reduce the number of required parking spaces, provide credits for shared and on-street parking, require connectivity between parking areas, and improve the pedestrian and cyclist environment within parking areas;**
- **Require access management techniques to reduce congestion and minimize conflicts between motor vehicles and pedestrians and bicyclists;**
- **Create a new County agricultural zone district that dramatically increases the minimum lot size in an effort to preserve farm land;**
- **Create a new County rural residential zone district that requires the use of conservation subdivision standards;**
- **Create a new French Broad River Conservation Corridor overlay zone district to conserve irreplaceable agricultural, historic and environmental resources; and**
- **Create definitions and standards for urban agricultural practices and allow these uses throughout the community.**

## Section 1:

# Introduction

**Knox County is one of only 50 communities selected to participate in the Robert Wood Johnson Foundation's Healthy Kids, Healthy Communities initiative.** Funds from the grant are being used to improve opportunities for physical activity and access to affordable, healthy foods for children and families in Knox County.

Childhood obesity is a growing issue in the United States and Knox County. Adult obesity rates increased in 23 states and did not decrease in a single state in the past year, according to *F as in Fat: How Obesity Policies Are Failing in America 2009*, a report released in June, 2010 by the Trust for America's Health and the Robert Wood Johnson Foundation. The report documents that the percentage of obese or overweight children is at or above 30 percent in 30 states. Tennessee ranked fourth, behind Mississippi, Alabama and West Virginia, with an adult obesity rate at 30.2%, and ranked fifth in the childhood obesity rate at 36.5%.

The places we live and what we eat contribute to this epidemic. Where people live, work, play and learn are important factors in determining the health of children and their families.

Two themes emerge from recent literature that sum up the effort at a regulatory level to fight childhood obesity. Local government policies and regulations can do more to encourage the development of places that promote and support:

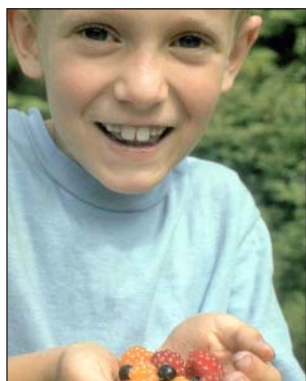
- **Active Living; and**
- **Healthy Eating.**



The focus of this study is the identification of development-related regulations, policies and practices of Knoxville and Knox County local government that serve as barriers to active living and healthy eating and the identification of actions necessary to remove these barriers in order to ensure that active living and healthy eating are as easy as possible.

**Active Living** can be defined as “a way of life that integrates physical activity into daily routines, with the goal being to accumulate at least 30 minutes of activity each day.” The theme of Active Living is reflected in the land use planning principles identified in the Smart Growth planning movement. The principles

of smart growth encourage growth in cities surrounded by a regional context of green infrastructure and supported by multi-modal transportation systems. Cities should include neighborhoods that are designed to be compact, mixed-use, and pedestrian friendly, as well as safe, convenient, attractive, and affordable. These neighborhoods can promote active living and provide a place to nurture healthy children.



**Healthy Eating** can be defined as “a way of life that is influenced by what we eat, how much we eat and how our food is prepared. Healthy food should be moderate in calories and

nutrient dense (rich in vitamins and minerals). Healthy eating includes eating appropriate portion sizes, balancing how foods are eaten, and choosing foods that are prepared using healthy cooking methods.” The theme of Healthy Living is being expressed through a growing demand in many metropolitan areas for urban agriculture. Nationally, many cities faced with declining populations have turned to urban agriculture in an effort to redesign their urban footprint to include natural drainage systems and farming. Locally, the residents of Knoxville have expressed a desire to raise hens at home, join with their neighbors in a community garden and share their home-grown produce in farmer’s markets, local food stands and neighborhood restaurants.

There are many tools available to move Knoxville and Knox County toward more active living and healthy eating. This study focuses

on the Knoxville and Knox County framework of development regulation. The City of Knoxville and Knox County regulate land use and development of private property through their zoning ordinances. The City and County also have the ability to address public transportation and recreation infrastructure through their adopted policies and capital improvement programs. The Metropolitan Planning Commission administers regulations related to new public improvements through its established subdivision regulations.

The Knox County Healthy Kids, Healthy Communities Partnership is focusing its efforts on creating healthier local neighborhoods in target communities with high rates of childhood obesity. Initially, the Partnership is working with three communities: Lonsdale, Inskip and Mascot. During the next four years, at least 10 Knox County communities will be involved with the Partnership. Two priorities will be to create safer places for children to walk, bike and play near their homes by expanding neighborhood Safe Routes to School options, and to improve access to healthy, affordable foods by starting community gardens and adding to the number of healthy food and beverage options offered at local convenience stores. Because four out of 10 children in Knox County are either overweight or obese, increasing access to healthy foods and providing safe places for youth activity are essential to supporting behavior that leads to a healthy weight.

This study will offer analysis methods and tools as examples of best practices, with a focus on the neighborhoods of the Healthy Kids, Healthy Communities Partnership.

## Section 2:

# The Benefits of Active Living and Healthy Eating



The community benefits of active living and healthy eating extend far beyond the important health issues of the local population. The residual effects of addressing healthy kids extend to creating a healthy community that is sustainable and capable of supporting many future generations.

### **Decreased Incidence of Obesity in Knox County**

Increasing the opportunities for active living and healthy eating may be the only sustainable way to address the epidemic of obesity. The places we live, work, shop, play and learn must become more walkable and less reliant on the automobile for access.

With the creation of compact, walkable, mixed-use neighborhoods, behaviors that have created the epidemic can be modified to a more active, healthy way of living.

### **Decreased Incidence of Hunger in Knox County**

A related benefit of confronting the issue of obesity is that the problems of hunger within our community can also be addressed. With an effort to create more opportunity for healthy eating among children, issues of hunger among other segments of the population can also be addressed. The young, the elderly, the poor, and the homeless all face hunger on a daily basis. Increasing the

opportunities for healthy eating can also address hunger issues for many segments of the population.

### **Better Food Equity**

Less healthy food disparity in low-income areas through an increase in local urban agriculture activities can serve to reduce or eliminate inequities that exist in the way food is distributed through the community.

### **A Stronger Knox County Economy**

As the price of gasoline, and its immediate impact on transportation costs, has increased, so has the interest in a more sustainable food production system in the United States. Today's system of delivering food to the tables of Knox County families is an international network of growers, processors, distributors, and retailers. Gone are the days of a pre-World War II local food system. But higher gasoline prices are changing the food production and delivery model. There is growing interest in growing food closer to local markets. This interest should be supported by local development policies that make it easier for local food industries to flourish. As they do, the local economy will be aided through the direct and indirect economic impacts of a growing local food industry.

### **Sustained Property Values**

Increased demand for farmland because of increased importance to local and regional food markets, as well as increases due to infill and redeveloped land within existing neighborhoods can help sustain property values in the rural and urban areas of Knox County. Valuable farm land will be able to stand on its own merit, rather than being a source of land for the next wave of affordable housing. With an emphasis on compact,

mixed-use development, the City may see an increase in values on land once passed over.

### **Cleaner Air**

A locally based food economy would result in improved air quality, both locally and nationally, because of reduced reliance on fossil fuels to produce, process, transport, and dispose of food and food waste. With less transportation, there would be less consumption of fuels. With a more local food system, the scale of production, processing and waste disposal could also be reduced, thus resulting in a less fuel-dependent industry. A smaller, more local food industry would result in better air quality.

### **Cleaner Water**

Less ground and surface water pollution through decreased use of chemical fertilizers and pesticides in agriculture, which adversely affect drinking water supplies, can be a result of a growing importance on local sustainable urban agriculture and close-to-market farm production. Again, transportation impacts can be minimized by shrinking reliance on the international network of food production and shifting back to a more locally based, such as was the norm prior to World War II, agricultural industry.

### Section 3:

## The Principles of Designing for Active Living and Access to Healthy Food



Many of the forces that have contributed to health issues such as obesity can be traced to the way in which our communities have been developed since World War II. An emphasis on single-use zoning, road building with a focus on accommodating only motor vehicles and greenfield development instead of redevelopment and reinvestment in our existing neighborhoods has led to the sprawling, fiscally wasteful, unhealthy development patterns that are now the convention and require the support of the automobile, to the exclusion of other modes of transport.

**To promote active living for all our residents,** communities and neighborhoods should be designed to incorporate the principles of the smart growth movement:

- Complete neighborhoods that are compact, walkable, diverse and connected should be developed within a regional context that supports transit use and protects the region's green infrastructure.
- A complete neighborhood should enable diverse activity, including a mix of housing choices, shopping and working opportunities, and recreation and civic uses. Larger parcels should no longer be devoted solely to a single land use.

- A sustainable city should be lively with a variety of activities within each neighborhood. Living, working, shopping, learning and socializing must be able to coexist in close proximity so that people (particularly children) may walk from one activity to another.
- A healthy neighborhood includes a range of housing options. A variety of housing types encourages a diversity of ages and incomes. Affordable housing is healthier when it is everywhere rather than concentrated in small, insular areas. The concept of aging in place is gaining traction – a neighborhood with a variety of housing types supports single people, newlyweds, young growing families, and empty nesters as well as those who need nearby medical and family support.
- Neighborhood-oriented retail can satisfy the daily shopping needs of an area in a setting that encourages walking. Small retail centers can form the social center of a community and become an important part of the social infrastructure of neighborhoods.
- An ideal neighborhood has a balance between housing and jobs. With as many jobs as workers in an area, the opportunity to reduce peak hour traffic congestion is maximized. Opportunities for alternative modes of work-related travel, such as transit, walking and bicycling, are also maximized.
- Schools, parks and civic space should be provided within neighborhoods at an appropriate scale. Rather than simply mandating that no bus service will be provided within a certain radius of a school, the community must commit to making it safe, convenient and comfortable for children to walk to school.

**To promote healthy eating,** communities must make it easy and permissible to grow and sell produce within neighborhoods and discourage the sale of unhealthy food near schools and



parks. The urban agriculture movement and food access principles exemplify the principles of healthy eating:

- Food security should be addressed through the regional preservation of prime agricultural soils and farmland.
- Urban agriculture should include temporary uses or more permanent responses to local food deserts, consumer demand, economic inequality, and mobility-constrained portions of the population.
- Conservation subdivisions should be established to cluster development in a cost-effective development pattern that protects vital green infrastructure and provides opportunities to preserve farmland and encourage community gardens.
- Community gardens should be everywhere and easy to establish.
- Growing and selling produce and other healthy food should be encouraged within every neighborhood.
- Access to healthy foods in all parts of the community should be promoted through local government policies and programs to assure that all citizens have access to healthy foods.
- Around schools and youth-oriented parks, access to some unhealthy food opportunities that do not promote healthy eating should be regulated so as to minimize the opportunity for unhealthy eating by school-aged populations.

## Section 4:

# Analysis of Barriers within the Knoxville-Knox County Subdivision Regulations



SIDEWALKS		
Regulation/Policy	Analysis	Recommendation
AUTHORITY		
Current regulations are permissive with regard to sidewalks: the planning commission may require sidewalks be provided (Section 63-10) under specified circumstances: for access to schools, recreation facilities, commercial establishments, and other areas where obvious future pedestrian activity is anticipated.	Through Concept Plan review, staff currently recommends that sidewalks be provided for subdivisions that are within Parental Responsibility Zones (PRZs) and for subdivisions that will have amenity areas. The Planning Commission has been inconsistent in approving the requirement of sidewalk installation.	<input type="checkbox"/> City and County should adopt sidewalk/ pathway policies and plans that delineate a system of desired sidewalks, greenways, and other pathways. <input type="checkbox"/> Subdivision regulation should be amended so that sidewalks are required in accordance with the policies and plans, except in specific instances when there is a physical hardship in providing sidewalks.
STANDARDS		
The regulations identify minimum construction standards for sidewalks. (Sections 63-20 and 73-10)	There are separate standards applied by Knox County and City of Knoxville. The County follows the Subdivision Regulations subject to meeting Americans with Disabilities Act (ADA) standards while the City uses Tennessee Department of Transportation (TDOT) standards.	<input type="checkbox"/> Regulations should be amended to provide construction standards that apply to City and County jurisdictions.
LOCATION		
The regulations do not indicate if sidewalks are to be located on one or both sides of the street.	When sidewalks are required they are usually located on only one side of a street and seldom are required on short cul-du-sacs.	<input type="checkbox"/> Regulations should be amended to require sidewalks on both sides of all streets. A reduction to only one side of the street could be considered in cases where topography severely restricts location on both sides.

SIDEWALKS . . . continued		
Regulation/Policy	Analysis	Recommendation
<b>LAYOUT</b>		
The regulations do not address layout and evaluation of sidewalks through Concept Plan review.	When sidewalks are recommended, the developer has identified which side of the streets the sidewalks will be located on. Until recently the proposed sidewalks have not been evaluated as to the impact of grading needed for the streets and access to proposed building sites on lots. This has at times required multiple changes in the location of sidewalks during the construction phase and requests to eliminate the sidewalk requirement.	<input type="checkbox"/> Regulations should be amended to require preliminary grading analysis for streets, sidewalks, home sites and stormwater system during the Concept Plan stage of the subdivision process.
<b>TIMING</b>		
The regulations do not address the timing of construction of sidewalks when the subdivision is developed.	In most cases sidewalks are not constructed by the developer until after the driveways and homes are constructed. Because of this practice, the sidewalks are installed in a piecemeal fashion, sometimes taking several years and creating several problems in the sidewalk layout and design.	<input type="checkbox"/> Regulations should require that sidewalks be planned and installed with the construction of the street. Driveways for home sites should be ramped from the street to the sidewalk and from the sidewalk to the home.
<b>BONDS</b>		
The regulations allow the recording of a final plat for a subdivision prior to completion of required improvements with the posting of a bond or other security to guarantee completion of improvements. (Section 78-20)	The regulations do not specifically identify that the bonds cover the costs associated with sidewalks, pathways or other proposed recreational amenities. The City and County have their own bonding procedures that cover sidewalk improvements. The posting of bonds with the County includes the cost of materials for improvements but does not include labor costs. Some bonds have been extended for several years.	<input type="checkbox"/> Review bonding requirements with both the City and County to make sure that adequate funds are available to guarantee installation of sidewalks, and when appropriate, approved recreational amenities. Evaluate the length of time that bonds are held and required improvements are not installed.
<b>MULTI-USE PATHWAYS</b>		
The regulations do not address the use of multi-use pathways.	When multi-use pathways are proposed within a subdivision it is usually part of a recreational amenity for the subdivision. It has been a practice of Planning Commission staff to require recreational amenities only when the proposed subdivision has 150 or more lots. There are no standards for multi-use pathways.	<input type="checkbox"/> Regulations should be amended to include appropriate locations, minimum design and construction standards for multi-use pathways.
<b>IN GENERAL</b>		
	The streets and roads maintained by the City and County are their largest asset and they should be useful to and used by all residents. The concept of Complete Streets should be embraced by Knoxville and Knox County. Complete streets are designed for all users – pedestrians, bicyclists and transit, as well as automobiles and trucks.	<input type="checkbox"/> City and County should adopt a Complete Streets policy. <input type="checkbox"/> The standards in the Subdivision Regulations should be amended to reflect Complete Streets policy.



## GREENWAYS AND BIKE LANES

Regulation/Policy	Analysis	Recommendation
<b>AUTHORITY</b>		
The regulations do not address the the provision of greenways.	During concept plan review, if it is determined that a proposed greenway will cross a property, a condition of approval requires the applicant contact the City or County Greenway Coordinator to determine if a greenway easement will be required.	<input type="checkbox"/> Recommend that the same process is followed but also look at steps to improve connections to greenways that are off the property.
<b>STANDARDS</b>		
The regulations do not include any standards for bike paths or bike lanes.	Only rarely has the Planning Commission's approval of a plat included bike lanes as a part of the street profile.	<input type="checkbox"/> City and County should adopt a Complete Streets policy. <input type="checkbox"/> The standards in the Subdivision Regulations should be amended to reflect Complete Streets policy.





### CONNECTIVITY (VEHICULAR AND PEDESTRIAN)

Regulation/Policy	Analysis	Recommendation
<b>STREETS</b>		
The regulations currently state that all streets shall be designed so that they may be feasibly extended into adjacent property. (Section 62-96)	While many subdivisions include a stubbed street(s) that would allow for connection to adjoining undeveloped property, the failure of this provision is requiring adjacent subdivisions to connect to existing stub-out streets. The Planning Commission very seldom requires that streets be connected if the residents of the existing subdivision and the developer of the new subdivision are opposed to the connection(s).	<input type="checkbox"/> Regulations should be amended to make it mandatory to connect to existing stub-out streets unless topography makes it unfeasible. Recorded Final Plats and signs at end of stub-out streets should make it clear that the stub-out street is designed for future connection.  <input type="checkbox"/> The Planning Commission should insist on preserving the ability for future street connectivity.
<b>SIDEWALKS</b>		
The regulations state that when sidewalks can be connected to existing walks in adjacent areas, the proposed walks should be designed on that side of the street which will make this connection possible. (Section 63-10)	The regulations do not adequately address connections of sidewalks and multi-use pathways with external systems. With some subdivision approvals, the developer has been required to post a bond for the cost of a sidewalk along the subdivision's frontage on existing public streets. If the sidewalk will not connect to an external sidewalk within five years, the bond is released.	<input type="checkbox"/> Planning Commission staff should coordinate with Knoxville and Knox County Engineering and Parks and Recreation staff to develop a long-range plan to provide pedestrian connections between developments and public facilities and amend the Subdivision Regulations to help in the implementation of the plan.





## TRAFFIC CALMING

Regulation/Policy	Analysis	Recommendation
<b>IN GENERAL</b>		
The regulations currently do not require or specify any traffic calming requirements or methods.	Traffic calming involves the use of physical measures to reduce traffic speeds and/or cut-through volumes, in the interest of street safety, livability, and other public purposes. Traffic calming can encourage active living by supporting a safe, comfortable and convenient network of pedestrian and biking pathways.	<input type="checkbox"/> Regulations should be amended to require traffic calming devices when appropriate to reduce traffic speeds and enhance pedestrian and bicyclist environments.





## OPEN SPACE AND RECREATIONAL AMENITIES

Regulation/Policy	Analysis	Recommendation
<b>AUTHORITY</b>		
The regulations currently state that the Planning Commission may require the dedication or reservation of usable open space within a subdivision up to a total of 10% of the gross area or water frontage of the subdivision for park, school, or recreation purposes. (Section 68)	It has been the practice of Planning Commission staff to recommend recreational amenities for subdivisions having 150 or more lots. The type of amenities and amenity area is proposed by the developer. In most cases, subdivisions with less than 150 lots have not provided recreational amenities. When recreational amenities are provided, sidewalks have been recommended to provide access to the amenity area from the lots.	<input type="checkbox"/> Regulations and staff's practice should be amended to provide consistent application of open space requirements.  <input type="checkbox"/> Implementation of a "payment in lieu of" system for providing adequate open space and recreational amenities should also be considered. A payment in lieu of system would allow funds to be placed in a park and recreation improvement fund to help in the development of parks (including connections to parks) in the area of the proposed subdivision.
<b>VARIANCES</b>		
The regulations include sections to allow variance from requirements for large-scale development and design innovations. (Sections 82-20, 82-21 and 82-22)	There is no clear direction as to how these sections were intended to be utilized.	<input type="checkbox"/> These sections should be evaluated in light of proposed changes to the regulations that address conservation subdivisions, hillside regulations, form based code districts and planned districts.
<b>CONFLICTS WITH ZONING</b>		
The Planned Residential Districts in both the City and County Zoning Ordinances require the provision of open space for recreational use.	The section on recreation uses in both zoning ordinances requires at least 15% of the gross development area be set aside. This conflicts with the Subdivision Regulations, which state that the Planning Commission may require up to 10%.	<input type="checkbox"/> The Zoning Ordinances and Subdivision Regulations should be evaluated and modified to have consistent requirements.  <input type="checkbox"/> Definitions for open space should be evaluated and modified to be consistent with intent of the regulations.  <input type="checkbox"/> The Planned Districts in both Zoning Ordinances should be evaluated to consider if open space areas and recreational amenities, including multi-use pathways, should be required as a part of the development plan.

## Section 5:

# Analysis of Barriers within the Knoxville and Knox County Zoning Ordinances

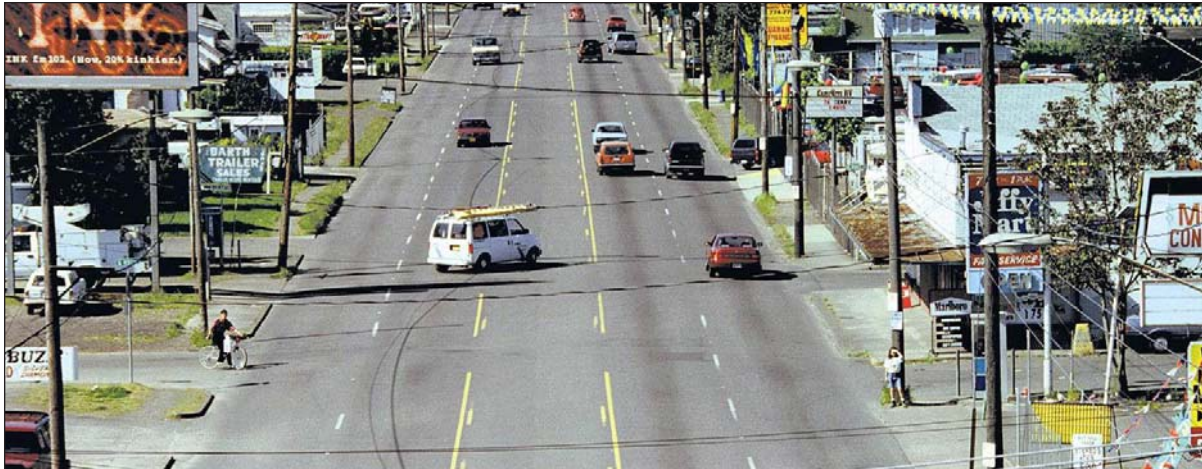


### SINGLE-USE ZONING DISTRICTS

Regulation/Policy	Analysis	Recommendation
<b>MIXED USES NOT ALLOWED</b>		
<p>The City and County zoning ordinances currently rely predominantly, with a few exceptions, on single-use zone districts to promote a strict separation of places for living and working; for example:</p> <ul style="list-style-type: none"> <li>• Zones for houses do not allow apartments.</li> <li>• Zones for residential uses do not allow office and commercial activity.</li> <li>• Zones for offices do not allow other commercial uses.</li> <li>• Zones for industry do not allow commercial or office uses.</li> </ul>	<p>The scheme of single-use zoning promotes the isolation of low-density housing from all other land uses, including other types of housing, and leads to reliance on the automobile for nearly all personal travel, dramatically increasing the community's total vehicle miles traveled, a leading indicator of pollution, traffic congestion, sprawl, and fiscal inefficiencies. The strict separation of residential uses within distinct zone districts leads to housing inequity, requires moving from a neighborhood in order to change housing type, and makes it difficult to "age in place."</p> <p>Commercial corridors are now typically lined with single-use commercial zone districts, creating a barrier to mixed-use, transit-oriented development along these corridors.</p> <p>Office and other work opportunities should also be allowed in close proximity to neighborhoods, either in mixed-use neighborhood centers or along adjacent or nearby arterial corridors.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> The R-1 (City) and RA (County) low-density residential zones districts are revered, but new zone districts should be created to be broader in approach by allowing a greater array of housing and some neighborhood-scaled commercial uses to be considered. This can be accomplished by adopting guidelines or design review criteria to assure compatibility with neighborhoods.</li> <li><input type="checkbox"/> Other residential zone districts should be amended to allow compatible activity at acceptable scales.</li> <li><input type="checkbox"/> Zones that are now exclusively office and commercial should be modified to allow medium- and high-density residential uses with acceptable design and scale.</li> <li><input type="checkbox"/> All residential zones should allow a variety of housing types, including accessory dwelling units, to increase density and achieve neighborhoods that can support transit.</li> <li><input type="checkbox"/> Office and work opportunities should be allowed within walking or biking distance of neighborhoods.</li> </ul>

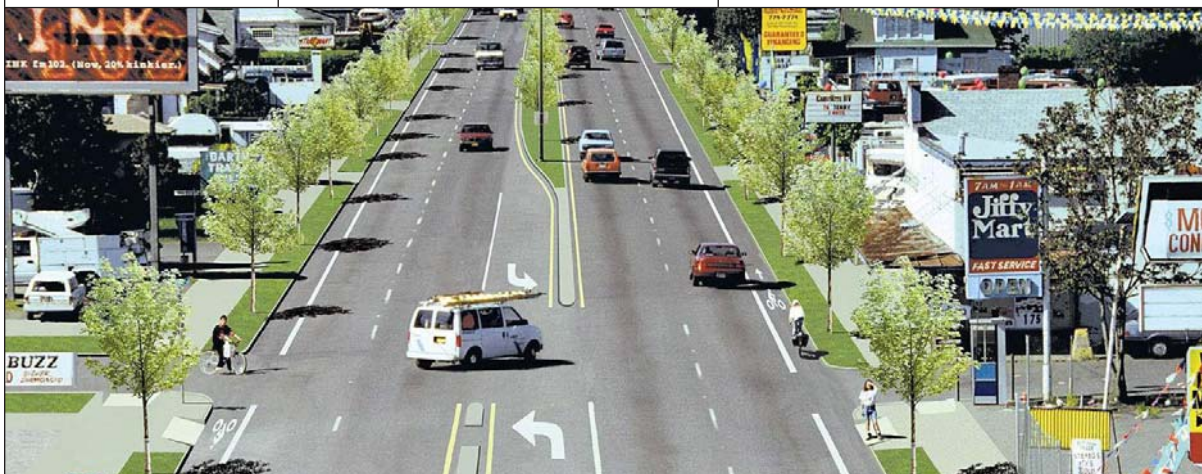
SINGLE-USE ZONING DISTRICTS . . . continued		
Regulation/Policy	Analysis	Recommendation
<b>LARGE YARDS REQUIRED</b>		
<p>The City and County zoning ordinances rely predominantly on dimensional requirements for yards and height that promote sprawl:</p> <ul style="list-style-type: none"> <li>• Required yards, particularly front yards, are generally very large.</li> <li>• Height restrictions, particularly in the City, for office and commercial zone districts are low.</li> </ul>	<p>The combination of large yards and low heights yield single-story development surrounded by asphalt and grass, a description of sprawl. Sprawl consumes open space, requires greater vehicle miles traveled, and is fiscally inefficient.</p> <p>Large commercial front yards, often filled with parking lots, and low heights also detract from the creation of safe and comfortable pedestrian space within our rights-of-way, resulting in fewer people walking instead of driving.</p> <p>Along predominant commercial corridors, developing with more intensity would result in more saved green space elsewhere, promote transit-oriented development and lead to better fiscal performance.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> In the City and County zoning ordinances, the relationship of required yards, maximum building height and lot coverage should be examined.</li> <li><input type="checkbox"/> Existing districts should be modified, or new mixed-use districts created, that provide appropriate dimensional requirements for transit-oriented development along major commercial corridors.</li> <li><input type="checkbox"/> To enhance the quality of our streetscapes, front yard requirements should be modified to require landscaping and street trees in close proximity to street rights-of-way, unless there are already street trees within the right-of-way.</li> </ul>
<b>BACKWARD PERMITTED USES</b>		
<p>City Neighborhood Commercial (C-1) district allows gas stations as a use by right and restaurants and dwelling units as a use on review.</p>	<p>This scheme of permitted uses seems backwards. Neighborhood commercial districts should support and complement walking and biking opportunities from surrounding neighborhoods, not auto-oriented uses such as gas stations.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Change the ordinance to allow gas stations as a use permitted on review.</li> <li><input type="checkbox"/> Change the ordinance by developing standards for neighborhood-supporting uses such as restaurants and dwelling units and permit as a use by right.</li> </ul>
<b>OVERLY REVIEWED</b>		
<p>City Zoning Ordinance requires use on review approval for home occupations.</p>	<p>Standards are established within the ordinance for home occupations. With these standards, review and approval by the Planning Commission should be unnecessary. Such uses that have required standards should be a permitted use by right.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Home occupations should be a use by right, as they are in the County ordinance and many other communities.</li> <li><input type="checkbox"/> Standards should be modified to provide a credit toward required off-street parking if adequate on-street parking is available.</li> </ul>





## COMPLETE STREETS AND SIDEWALK REQUIREMENTS

Regulation/Policy	Analysis	Recommendation
<b>IN GENERAL</b>		
In general the zoning ordinances do not address street or sidewalk requirements and specifications.	In planned zone districts and form districts, street and sidewalk requirements are addressed, but not in basic zone districts, which predate the addition of newer types of zoning.	<input type="checkbox"/> Adopt Complete Streets policies and standards. <input type="checkbox"/> Address street improvement requirements within the zoning ordinance and adopt complete street standards. <input type="checkbox"/> Develop and use more planned and form districts. <input type="checkbox"/> Amend supplemental regulations to address sidewalks on development sites.
<b>ACCOMMODATE PEDESTRIANS AND BICYCLISTS</b>		
In general, site plans, when they are required, do not address how pedestrian and bicycle travel will be safely accommodated on the site.	<p>It is important and practical for development to demonstrate that safe, comfortable and convenient pathways for pedestrians and bicyclists will be addressed through the site plan review process.</p> <p>Providing on-site connection from the street to the building is an important step in delivering an active living environment.</p>	<input type="checkbox"/> Site plan requirements should require a plan for on-site pedestrian and bicycle travel and bicycle parking.





## PARKING REQUIREMENTS

Regulation/Policy	Analysis	Recommendation
<b>REDUCING THE NUMBER</b>		
The City and County Zoning Ordinances require off-street parking at rates that are out-of-date within a scheme that promotes the use of the automobile and detracts from the opportunities to walk and bike.	The City and County Zoning Ordinances require off-street parking at rates that result in underutilized land, excessive cost, excessive impervious surface, increased storm water management costs, and detract from the character of the community.	<input type="checkbox"/> Off-street parking regulations should be modified to reduce parking quantities, direct parking locations, improve parking lot storm-water performance and make parking areas safer and more comfortable.  <input type="checkbox"/> Regulations for parking areas that accommodate pedestrians and bicyclists should be required.
City and County parking regulations do not address credits for on-street parking and shared parking arrangements as a way to reduce the need and cost of providing parking.	<p>On-street parking in an urban setting can be provided in lieu of off-street requirements, making it easier to redevelop existing buildings or reduce the number of required spaces for new development.</p> <p>Many land uses have operating characteristics that accommodate the sharing of parking spaces. In an effort to reduce the impact of expansive parking lots on the walking and biking experience, shared parking arrangements should be encouraged.</p>	<input type="checkbox"/> The off-street parking requirements of both zoning ordinances should be amended to provide credit for nearby on-street parking and create a formula to address shared parking.  <input type="checkbox"/> Adjacent commercial and office development should be required to provide cross-access easements. This will encourage shared parking and improve traffic management and pedestrian safety in the street.  <input type="checkbox"/> In some locations, the government should work to create shared parking opportunities.

PARKING REQUIREMENTS . . . continued		
Regulation/Policy	Analysis	Recommendation
<b>LOCATION</b>		
The City and County Zoning Ordinances do not prescribe the location of parking areas on a building site.	Excessively large parking lots, placed between the street and commercial land uses, contribute to a streetscape that discourages walking and biking, an important component of active living.	<input type="checkbox"/> Large parking areas for new development should be placed to the side or rear of buildings so as not to detract from the walking and biking experience on the street.
<b>MAXIMUM PARKING STANDARDS</b>		
The City and County Zoning Ordinances prescribe the minimum number of parking spaces required for each type of land use.	To minimize the damaging effect of large expanses of unused parking area on the walking and biking environment, a maximum number of off-street parking spaces can be established. Some communities allow the reservation of undeveloped land for future parking (if a need is demonstrated) or require that spaces in excess of the maximum be developed with pervious surfaces.	<input type="checkbox"/> Establishing maximum parking requirements should be examined for some zone districts. Reservations of land can be allowed for future parking and kept as landscaped surface until a need is demonstrated, or pervious paving methods can be used for spaces above the maximum threshold.
<b>CONNECTIVITY</b>		
In some cases the zoning ordinances prohibit access from one parking area to another. (City-Article V, Section 7.A.7.a; County-Article 3.51.10)	This regulation may preclude connections between parking lots. Links between parking lots for cars can reduce congestion on streets and reduce idling and vehicle miles traveled. Links for bicyclists and pedestrians can make destinations more accessible.	<input type="checkbox"/> Eliminate this provision. <input type="checkbox"/> Require cross-access easements between parking lots.
<b>ACCESS MANAGEMENT</b>		
Proper access management to a site contributes to a pedestrian oriented environment as well as managing vehicular traffic.	The parking, access and driveway requirements in Article 5 of the City Ordinance and Article 3 of the County Ordinance do not reflect or require the best practices currently used to manage access to property. The rules of access management should be codified in the zoning ordinance.	<input type="checkbox"/> This issue needs to be addressed and updated with best management practices.
<b>ALLEY ACCESS</b>		
In the City Ordinance dwelling units may not be built unless the street or joint permanent easement provides the primary vehicular access. The ordinance states that alleys may provide only a secondary vehicular access. (Article 5, Section 6.D(9))	<p>This requirement makes no sense. It would not allow much of the residential development in Knoxville that occurred prior to World War II and does not allow the use of many existing platted lots.</p> <p>This requirement is contrary to many new urban forms endorsed by Smart Growth principles and specifically allowed in the TND-1 zone district.</p> <p>Alley use should be encouraged to enhance walkability in neighborhoods and promote active living.</p>	<input type="checkbox"/> The prohibition in most zone districts on alleys as a primary vehicular access for a lot with a dwelling unit should be eliminated.



### LANDSCAPING REQUIREMENTS

Regulation/Policy	Analysis	Recommendation
<b>LITTLE LANDSCAPING REQUIRED NEAR STREETS</b>		
The City and County Zoning Ordinances require little landscaping that contributes to the public realm, such as streets.	Street trees and other landscaping contribute to the safety and comfort of pedestrians. This can lead to higher rates of pedestrian activity.	<input type="checkbox"/> To enhance the quality of our streetscapes, front yard requirements should be modified to require landscaping and street trees in close proximity to street rights-of-way, unless there are already street trees within the rights-of-way.
<b>LITTLE LANDSCAPING REQUIRED IN PARKING AREAS</b>		
The City and County Zoning Ordinances parking area landscaping requirements do little to create a comfortable pedestrian experience within parking areas and do not adequately address storm-water runoff.	<p>Shade in a parking lot is important. One needs only to look at where vehicles are parked on a hot sunny day to determine that more shade would be welcomed. In addition, pedestrian routes through most parking areas are not clearly evident. Much can be done to create a safe, comfortable and convenient path for pedestrians in commercial parking areas.</p> <p>Storm-water runoff to the streets can be dramatically reduced by using proper landscaping methods within parking areas.</p>	<input type="checkbox"/> Require more shade trees and associated planting beds and more clearly defined pedestrian routes in parking areas. <input type="checkbox"/> Require landscaping techniques and design that reduce storm-water runoff.

OPEN SPACE REQUIREMENTS		
Regulation/Policy	Analysis	Recommendation
REQUIREMENTS		
<p>Planned Residential Zone Districts, used more and more in recent development, require a minimum amount of open space:</p> <ul style="list-style-type: none"> <li>• City (Article IV, Section 3.1.C.2)</li> <li>• County (Article 5, Section 5,13,02.C)</li> </ul>	<p>Practice has been to count the yards of individual houses towards meeting open space requirements.</p> <p>This practice results in little usable open space being developed within planned residential zone districts. This is contrary to the intent of the districts and results in a shortfall of shared usable parks and open space. As a result, children must be chauffeured to an often faraway park to play.</p> <p>In addition to recreation, commonly owned, accessible open spaces can also be used for community gardens or commercial farming activities.</p> <p>The section on recreation uses in both ordinances requires at least 15% of the gross development area be set aside. This conflicts with the Subdivision Regulations, which state that the Planning Commission may require up to 10%.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Change definitions and common practice and require a minimum percentage of the district area be set aside for commonly owned, accessible, usable open space.</li> <li><input type="checkbox"/> The Zoning Ordinances and Subdivision Regulations should be evaluated and modified to have consistent requirements.</li> </ul>



OPEN SPACE REQUIREMENTS		
Regulation/Policy	Analysis	Recommendation
<b>DEFINITIONS</b>		
<p>There is no definition of open space in the County zoning ordinance.</p> <p>The City zoning ordinance definition of "useable open space" is: <i>That portion of a lot which is free of buildings, is not devoted to driveways and parking areas, is available and accessible to the occupants of dwelling units on the lot, and is of reasonable dimension to allow use for active or passive recreation or other outdoor activities. Useable open space may include play lots, garden, sundecks, courts, courtyards, and private balconies. Semi-private balconies, not providing primary access to the units, may also be classified as useable open space for the dwelling unit or units served.</i></p>	<p>The definition of useable open space in the City's zoning ordinance allows the yards of privately owned lots developed with houses to count toward meeting minimum useable open space requirements and is clearly contrary to the intent of the use of the term within the regulations for specific zone districts, such as those for RP-1.</p>	<p><input type="checkbox"/> The definition must be amended to eliminate the conflict with the intent of the requirement as stated in district regulations.</p>





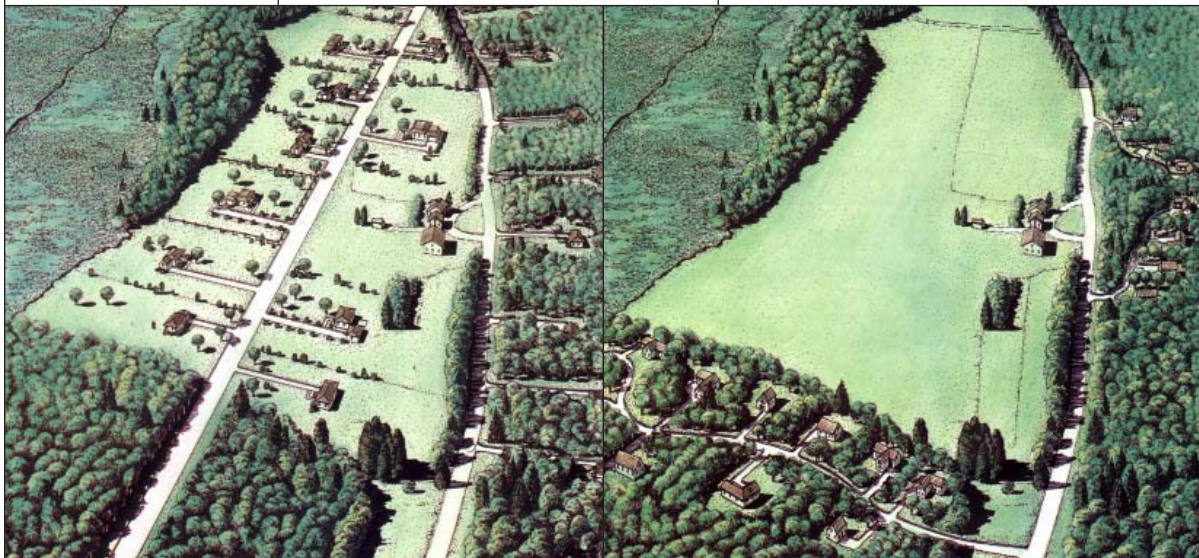
### URBAN AGRICULTURE AS A PERMITTED USE

Regulation/Policy	Analysis	Recommendation
<b>UNCERTAINTY</b>		
The Knoxville Zoning Ordinance allows agriculture uses within the residential zones, but is ambiguous about the practicality of actual agricultural uses within existing neighborhoods.	This ambiguity about agriculture in the R-1 and other residential zone districts results in difficulty in practicing what is becoming known as urban agriculture, most recently expressed with discussion about creating community gardens and keeping hens.	<input type="checkbox"/> Adequate definitions for the practices of urban agriculture must be created and these uses should be permitted by right in all zone districts.
<b>ACCESSORY STRUCTURES</b>		
Accessory structures, such as storage sheds, compost areas, waste structure, etc., must by current definition be accessory to a principal building, rather than to a principal use, such as a farm or garden.	The current definition for an accessory structure requires that there is a principal structure, thus making impossible the permitting of accessory structures on a lot used for urban agricultural uses.	<input type="checkbox"/> The definition of accessory structure should be changed to allow it as accessory to a use, rather than a structure. <input type="checkbox"/> The definitions of urban agricultural uses must specifically call out the permitting of accessory structures.
<b>DEFINITIONS</b>		
Elements of urban agriculture, such as the keeping of hens, community gardens, farmers markets, and farm stands, are not specified in the zoning ordinance.	The concept of urban agriculture is growing throughout the U.S. The City and County zoning ordinances do not reflect the terminology and regulatory framework that could guide such development.	<input type="checkbox"/> Proper definitions and standards for the uses identified with the urban agriculture movement should be adopted in the zoning ordinances.



### THE COUNTY AGRICULTURAL ZONE DISTRICT

Regulation/Policy	Analysis	Recommendation
<b>THE PREDOMINATE ZONE IN THE COUNTY</b>		
<p>Nearly 70% of Knox County, outside municipal boundaries, is still zoned Agricultural.</p> <p>The Agricultural district of the Knox County Zoning Ordinance allows residential development with a minimum lot area of 1 acre. In addition, it allows all manner of agriculture and other uses of like intensity.</p>	<p>This district encourages suburban sprawl in Knox County. With the advent of commonly owned, community wastewater treatment systems, it could become even more so.</p> <p>The sprawl produced by this district erodes Knox County's green infrastructure (open space, farms, riparian areas, etc.), places a fiscal burden on County finances, and results in isolated subdivisions with no connections to one another or to other community facilities, thus adding to vehicle miles traveled and virtually no pedestrian or bicycle activity.</p> <p>The district discourages and reduces the opportunity for future active living and healthy eating.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> A new Agriculture district with a much larger minimum lot size must be created. This district could require conservation subdivisions at an appropriate density, with adequate minimum open space requirements.</li> <li><input type="checkbox"/> A new Rural Residential district could also be created to protect existing rural subdivisions.</li> <li><input type="checkbox"/> A conservation subdivision could be utilized in both new districts: as a use on review with prescribed density in the new Agricultural district and as a use by right at a prescribed density in the new rural residential district. A conservation subdivision would have a prescribed open space requirement.</li> </ul>





### FOOD ACCESS

Regulation/Policy	Analysis	Recommendation
<b>MIXED-USE ZONING NEEDED</b>		
The current zoning ordinances rely predominantly on single-use districts which promote the strict separation of uses, resulting in urban sprawl by prohibiting a mix of neighborhood-scaled shopping and work opportunities in close proximity to where most people live.	<p>Access to food stores and markets is strictly prohibited within most residential zone districts, requiring many vehicle miles traveled in pursuit of food.</p> <p>Allowing these stores in or near neighborhoods would create more outlets for fresh produce, would provide better access to food, and create more walking and biking destinations from neighborhoods.</p>	<p><input type="checkbox"/> Appropriately scaled food stores and markets, with proper development criteria, should be allowed in mixed-use neighborhood centers or in close proximity to all residents by allowing them in residential districts.</p>



FOOD ACCESS . . . continued		
Regulation/Policy	Analysis	Recommendation
<b>MAKE UNHEALTHY FOOD SOURCES LESS ACCESSIBLE TO CHILDREN</b>		
<p>The current zoning ordinances do not discourage or even require review of drive-through food facilities, such as fast food, take-out food and other formula food establishments in most zone districts.</p> <p>(Note: Formula food is characterized by the required use of standardized menus, staff uniforms, and interior and exterior signs and décor, as well as using a name, building appearance and format that is virtually identical regardless of ownership.)</p>	<p>Access to fast food, take-out food and other formula food establishments by school age populations can present opportunities for students that are more attractive than healthier food offered on campus or brought from home. Some communities have begun controlling the location of these types of food places to keep them from locating in close proximity to existing schools. Limiting access to this type of food by managing locations in close proximity to schools would encourage healthy eating.</p>	<p><input type="checkbox"/> Consider adopting additional definitions for restaurant types and limit locations of fast food, take-out food and other formula food facilities through standards or a use-on-review process.</p>



## Chapter 6:

# Action Plan to Address Barriers to Active Living and Healthy Eating in Knoxville and Knox County



Obesity in the childhood and general population of Knoxville and Knox County is consistent with the national trend – rates are increasing rapidly and obesity is fast approaching epidemic conditions. Among the many factors contributing to this trend is the way our communities have been developed. Long-range comprehensive plans have generally failed to include land use considerations that acknowledge healthy living patterns. Development regulations, such as the Knoxville-Knox County Subdivision Regulations and the Zoning Ordinances of the City and County, encourage development patterns that contribute to unhealthy lifestyles rather than making active living and healthy eating not just possible, but easy.

A number of regulatory and policy barriers have been identified in Knoxville and Knox County plans, policies and development regulations. A concerted effort to remove these barriers is necessary to adequately address the problem of obesity in the population over the long term, and in their place create plans, policies and regulations that encourage active living and healthy eating.

### A FRAMEWORK FOR ACTIVE LIVING

The theme of active living is best characterized by development consistent with the principles of what is known as Smart Growth. To encourage smart growth, Knoxville and Knox County plans, policies and regulations should:

- 1. Encourage neighborhoods with a mix of land uses** within easy walking distance. Single land use development patterns that require only a single type of land use are inconvenient and require more driving.
- 2. Take advantage of existing community assets** such as local parks, community schools and other public investments as central focus points of neighborhood development and make them accessible to everyone.
- 3. Allow a range of housing opportunities and choices** within all neighborhoods. A diversity of housing choices will encourage a sustainable population mix within all neighborhoods, aging in place and begin to achieve densities adequate to support transit.
- 4. Create compact, connected, walkable neighborhoods** that provide safe, convenient and comfortable sidewalks, but also have interesting places to walk to – such as parks, schools, stores and civic institutions.
- 5. Provide a variety of transportation choices.** People's dependence of cars will continue until it is safe, convenient and comfortable to walk, bicycle and use transit as an alternative.



## STEPS TOWARD HEALTHY EATING

Healthy eating can become easier through the efforts of promoting active living. Again, from the principles of Smart Growth, Knoxville and Knox County plans, policies and regulations should:

### 1. **Preserve open space, prime agricultural lands and critical environmental areas**

that keep people connected to nature and encourage action to protect local farms, wildlife and ecosystems.

### 2. **Encourage growth and redevelopment in existing neighborhoods**

so that we don't have to push the development frontier into the rural countryside and consume our forests and farmlands.

In addition, there are changes in plans, policies and regulations that can make it easier to produce local healthy food and provide regulatory protection from food opportunities that are less healthy:

#### 1. **Make community gardens**

and their associated activities available for everyone everywhere.

#### 2. **Discourage unhealthy food choices**

in areas where the populations are most vulnerable, such as around schools and in areas where full service grocery stores are not easily available.

The following are suggested actions to encourage active living and healthy eating through changes to the long-range comprehensive plans, subdivision regulations and zoning ordinances of Knoxville and Knox County.

## Knoxville and Knox County regulations and policies should:

### **REQUIRE the necessary infrastructure to support active living as part of the development process – complete and connected street systems that encourage walking every day:**

- Require sidewalks
- Require complete streets
- Require street connectivity
- Require easements for future greenways
- Require street trees
- Require street-side and parking area landscaping
- Require conservation subdivisions in appropriate zone districts

### **ALLOW people to easily grow and share food as a community within complete neighborhoods and as an industry close to the city:**

- Allow community gardens and supporting accessory uses and structures
- Allow the buying and selling of garden produce within neighborhoods
- Allow conservation subdivisions to preserve farm lands and forests
- Allow a mix of uses within and near neighborhoods
- Allow a diversity of housing types in neighborhoods close to transit

### **INVEST in infrastructure to minimize the dependence upon the automobile in everyone's day-to-day living and provide opportunities for active living and healthy eating:**

- Invest in sidewalks
- Invest in bike lanes
- Invest in greenways
- Invest in parks
- Invest in community gardening sites
- Invest in open space preservation

## PLANNING AND POLICY NEEDS AND OPPORTUNITIES TO PROMOTE ACTIVE LIVING

### ✓ PLANNING AND POLICY OPPORTUNITY

#### **City and County should adopt a sidewalk plan and policy.**

A sidewalk plan and policy is necessary to provide a framework for making decisions about where sidewalks are needed. In addition, standards and responsibility for construction should be delineated.

- The City Council and County Commission should adopt a sidewalk plan and policy.
  - The plan and policy should uphold the principles of active mobility as it relates to active living.
  - The plan and policy should establish standards for sidewalks, bike lanes, and greenways.
  - This effort could be initiated by City Council and County Commission with a request to MPC, along with adequate resources, to add this item to its annual work program.
- Once the City Council and County Commission have adopted a plan and policy, MPC should amend the subdivision regulations to require sidewalks in accordance with the Plan and Policy.

- Once the City Council and County Commission have adopted a plan and policy, City and County Engineering departments should amend their land development and best management practice manuals to require sidewalks in accordance with the Plan and Policy.

### \$ THE NEEDED INVESTMENT TO PROMOTE ACTIVE LIVING

#### **City and County should build more sidewalks.**

- The City and County should use their Capital Improvement Programs to build sidewalks in existing developed areas in accordance with an adopted sidewalk plan and policy.
- The City and County should use their annual capital improvement plans to build sidewalks where they currently do not exist, prioritizing projects which extend the existing sidewalk system or close gaps in it.
- The City and County should create a neighborhood sidewalk improvement program and offer incentives to neighborhoods that dedicate their own resources to build or improve sidewalks.
- The City and County should foster local neighborhood involvement in sidewalk projects by providing matching funds to supplement local projects using special improvement districts to provide financial resources for sidewalks.





## PLANNING AND POLICY OPPORTUNITY

### **City and County should adopt a Complete Streets policy and standards.**

Complete streets are streets that provide mobility opportunities for all types of users – drivers, pedestrians, bicyclists and transit users of all ages and abilities. It should be the policy of Knoxville and Knox County to encourage alternatives to the sole use of motor vehicles for personal mobility.

- The City Council and County Commission should adopt a complete streets policy and standards.
- Plan and policy should provide opportunities for all types of mobility and utilities and delineate locations for all.
- This effort could be initiated by City Council and County Commission with a request to MPC, along with adequate resources, to add this item to its annual work program.

- Once the City Council and County Commission have adopted a plan and policy, MPC should amend the Subdivision Regulations to require street improvements in accordance with Complete Streets policy and standards.
- Once the City Council and County Commission have adopted a plan and policy, City and County Engineering departments should amend their land development and best management practice manuals to require street improvements in accordance with the Plan and Policy.



## THE NEEDED INVESTMENT TO PROMOTE ACTIVE LIVING

### **City and County should build more complete streets.**

- The City and County should use their Capital Improvement Programs to rebuild existing streets and build new streets in accordance with an adopted complete streets policy and standards.



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**PLANNING AND POLICY  
OPPORTUNITY**

**City and County should adopt park land dedication and park improvement policies.**

The recently adopted *Knoxville and Knox County Parks, Recreation and Greenway Plan* assesses the need for more parks, provides park land acquisition recommendations and identifies methods to provide resources for these activities.

- The City Council and County Commission should adopt park land dedication and park improvement policies.
- Plan and policy should make parks accessible to all, set park standards, and provide an equitable method for providing for land and improvements to neighborhood, community and regional parks.
- This effort could be initiated by City Council and County Commission with a request to MPC, along with adequate resources, to add this item to its annual work program.

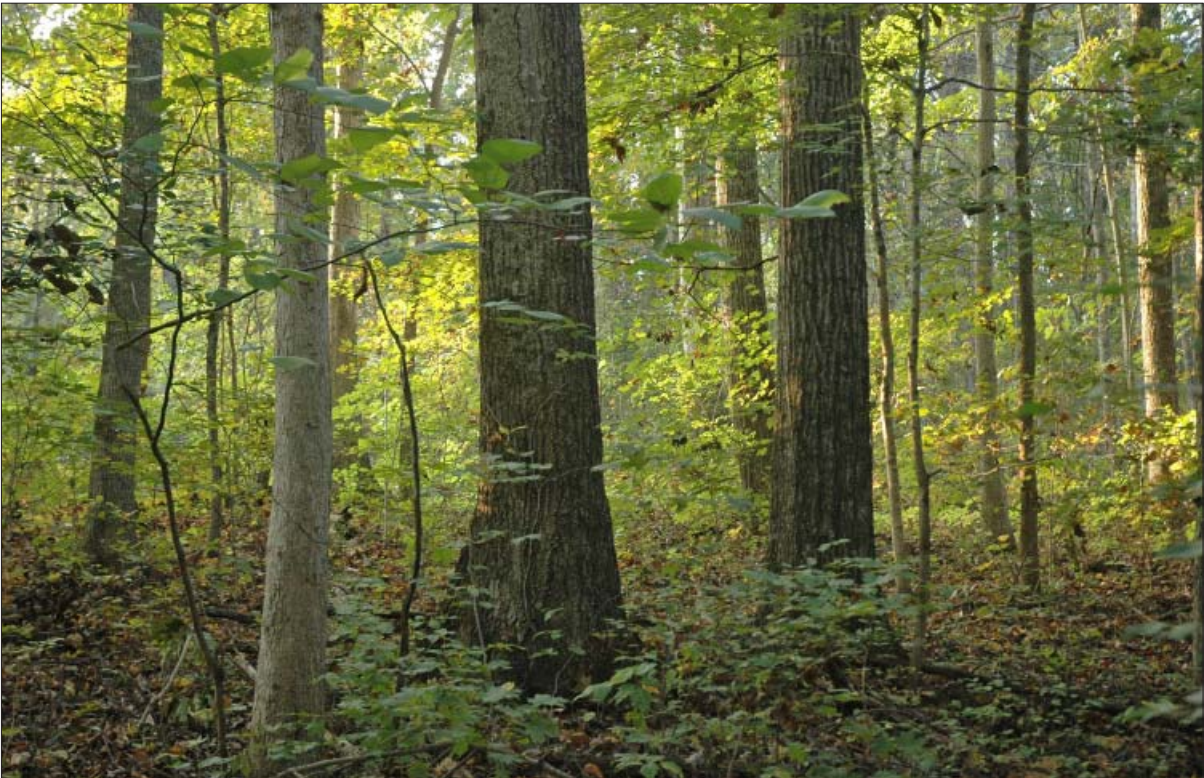
- Once the City Council and County Commission have adopted a plan and policy, MPC should amend the Subdivision Regulations to require park land dedication, or fee in lieu of land dedication, and a requirement or fee to provide adequate park improvements in accordance with adopted policies.
- Once the City Council and County Commission have adopted a plan and policy, City and County Parks and Recreation departments should amend their practices to provide adequate park improvements in accordance with adopted policies.

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**THE NEEDED INVESTMENT  
TO PROMOTE ACTIVE LIVING**

**City and County should acquire more land and build more parks.**

- The City and County should use their Capital Improvement Programs to acquire more park land and build more parks in accordance with an adopted park land dedication and park improvement policies.





## PLANNING AND POLICY OPPORTUNITY

### **City and County should adopt traffic calming policies and requirements.**

Traffic calming involves the use of physical measures to reduce traffic speeds and/or cut-through volumes, in the interest of street safety, livability, and other public purposes. Traffic calming can encourage active living by supporting a safe, comfortable and convenient network of pedestrian and bicycling facilities.

- The City Council and County Commission should adopt traffic calming policy and standards.
  - The policy should require incorporation of traffic calming in all new streets and encourage retrofitting of existing streets with traffic calming measures.
  - This effort could be initiated by City Council and County Commission with a request to MPC, along with adequate resources, to add this item to its annual work program.

- Once the City Council and County Commission have adopted a plan and policy, MPC should amend Subdivision Regulations to require street improvements in accordance with Traffic Calming policy and standards.
- Once the City Council and County Commission have adopted a plan and policy, City and County Engineering departments should amend their land development and best management practice manuals to require street improvements in accordance with Traffic Calming policy and standards.



## THE NEEDED INVESTMENT TO PROMOTE ACTIVE LIVING

### **City and County should implement traffic calming measures in new and existing streets.**

- The City and County should use their Capital Improvement Programs to install traffic calming measures in existing streets and incorporate measures in all new street projects.





## PLANNING AND POLICY OPPORTUNITY

### City and County should adopt a street connectivity policy.

Street connectivity reduces traffic congestion on collector and arterial streets by providing motorists with more options to get from point to point. A highly connected street system with sidewalks also promotes walking by providing more direct routes with reduced motor vehicle volumes and congestion. Street connectivity can encourage active living by supporting a safe, comfortable and convenient network of pedestrian and bicycling facilities.

- The City Council and County Commission should adopt a street connectivity policy.
  - The policy should encourage a highly connected system of streets and encourage retrofitting of existing streets to increase connectivity.
  - The policy should examine the role that street connectivity plays in improving access management along arterial streets.

- This effort could be initiated by City Council and County Commission with a request to MPC, along with adequate resources, to add this item to its annual work program.
- Once the City Council and County Commission have adopted a policy, MPC should amend subdivision regulations to require street connectivity in accordance with policy.
- Once the City Council and County Commission have adopted a plan and policy, City and County Engineering departments should amend their land development and best management practice manuals to require street improvements in accordance with street connectivity policy.



## THE NEEDED INVESTMENT TO PROMOTE ACTIVE LIVING

### City and County should increase connectivity of local streets.

- The City and County should use their Capital Improvement Programs to connect or reconnect local streets.



## PLANNING AND POLICY NEEDS AND OPPORTUNITIES TO PROMOTE HEALTHY EATING

### ✓ PLANNING AND POLICY OPPORTUNITY

#### **City and County should analyze vacant land for community garden uses.**

Community gardens can provide a variety of fresh seasonal vegetables for the area. A key to the development of community gardens throughout the community is an inventory of land available for community groups to garden.

- The City and County should engage MPC to complete, maintain and make available an inventory of land available for garden use by community organizations.

### \$ THE NEEDED INVESTMENT TO PROMOTE ACTIVE LIVING

#### **The City and County should provide vacant lots currently under their control to community groups for community gardens.**



### ✓ PLANNING AND POLICY OPPORTUNITY

#### **City and County should include Green Infrastructure analysis and plans within its Knoxville-Knox County General Plan 2033.**

Green infrastructure can play an important role in creating the social and governance culture to support sustainable development, active living, and healthy eating. The preservation and protection of a green infrastructure can provide a framework for future development while protecting valuable and important forests, prime agricultural lands and other natural features of the local landscape.

- MPC should include documentation, analysis of, and recommendations for preserving green infrastructure in its general planning documents.

## SUBDIVISION REGULATION CHANGES TO PROMOTE ACTIVE LIVING



### PLANNING AND POLICY OPPORTUNITY

#### **Require sidewalks in new subdivisions except when not needed due to low traffic numbers and speeds on local streets.**

Sidewalks are essential to creating more walking and greater transportation choices, especially access to transit. The Federal Highway Administration's "Course on Bicycle and Pedestrian Transportation" states: "It is desirable to have paved sidewalks on both sides of all streets in urban and suburban areas to provide mobility for disabled (as well as non-disabled) pedestrians."

- MPC should amend the subdivision regulations to require sidewalks in new development on both sides of arterial and collector streets in accordance with an adopted sidewalk plan. Sidewalks should also be required on local streets unless there is reason not to provide them.
- City and County Engineering departments should amend their land development and best management practice manuals to require sidewalks in new development on both sides of arterial and collector streets in accordance with an adopted sidewalk plan. Sidewalks should also be required on local streets unless there is reason not to provide them.



### PLANNING AND POLICY OPPORTUNITY

#### **Adopt sidewalk standards.**

The minimum width and location of sidewalks depends on the type of right of way within which they are located. The minimum width of a sidewalk should be five (5) feet. A planting strip to serve as a buffer against traffic on the street and to provide adequate space for street trees, mailboxes and utilities is essential,

especially on local streets. Along collectors and arterials, a wider sidewalk with planting boxes can be used in lieu of a full planting strip.

- The City Council and County Commission should adopt complete streets policy and standards.
  - Plan and policy should include sidewalk standards and provisions for landscaping within the street rights of way.
- Once the City Council and County Commission have adopted a plan and policy, MPC should amend the subdivision regulations to require sidewalk improvements in accordance with the plan.
- Once the City Council and County Commission have adopted a plan and policy, City and County Engineering departments should amend their land development and best management practice manuals to require sidewalk improvements in accordance with the plan.



### PLANNING AND POLICY OPPORTUNITY

#### **Adopt Complete Streets standards and requirements.**

Complete streets are streets that provide mobility opportunities for all types of users – drivers, pedestrians, bicyclists and transit users of all ages and abilities. It should be the policy of Knoxville and Knox County to encourage alternatives to the sole use of motor vehicles for personal mobility.

- The City and County should adopt complete streets policy and standards.
  - Plan and policy should provide opportunities for all types of mobility and utilities and delineate locations for all.
- Once the City and County have adopted a plan and policy, MPC should amend Subdivision Regulations to require street improvements in accordance with Complete Streets policy and standards.

✓	<b>PLANNING AND POLICY OPPORTUNITY</b>
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### **Adopt traffic calming policies and requirements.**

Traffic calming involves the use of physical measures to reduce traffic speeds and/or cut-through volumes, in the interest of street safety, livability, and other public purposes. Traffic calming can encourage active living by supporting a safe, comfortable and convenient network of pedestrian and bicycling facilities.

- The City Council and County Commission should adopt traffic calming policy and standards.
  - Policy should require incorporation of traffic calming in all new streets and encourage retrofitting of existing streets with traffic calming measures.
- Once the City Council and County Commission have adopted a plan and policy, MPC should amend the subdivision regulations to require street improvements in accordance with Traffic Calming policy and standards.
- Once the City Council and County Commission have adopted a plan and policy, City and County Engineering departments should amend their land development and best practice manuals to require street improvements in accordance with Traffic Calming policy and standards.



✓	<b>PLANNING AND POLICY OPPORTUNITY</b>
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### **Require street, sidewalk and greenway connectivity within and between subdivisions and neighborhoods.**

Roads and streets should be organized into an interconnected network, with arterial, collector and local roads all playing their role in a mobility system. An interconnected network of roads provides multiple routes to and from all destinations, thus reducing traffic congestion on main roads. Multiple routes benefit pedestrians and bicyclists: people who live in compact neighborhoods with highly connected street networks walk more, use transit more and drive less than those who live in conventional, large-lot, cul-de-sac dominated, isolated subdivisions. Highly connected neighborhoods are also safer because each street receives enough traffic to keep it active and supervised but not so much as to make it unpleasant for homeowners, pedestrians and bicyclists. In addition, multiple routes make it easier for emergency response providers

- MPC should enforce the subdivision regulations for new subdivisions to provide stubbed out streets to adjacent undeveloped land and expand its provisions to require that existing subdivisions allow new subdivisions to connect to existing stubbed out streets.
- Streets in new subdivisions should be designed with as many street connections (fewest cul-de-sacs) as possible, with minimum standards measured on a connectivity index.
- If street connections are not possible, pedestrian and bicycle pathways should be provided and connected to existing facilities and between neighborhoods.
- MPC should secure greenway easements from new development in accordance with the Knoxville-Knox County Parks, Recreation and Greenway Plan.



## PLANNING AND POLICY OPPORTUNITY

### **Adopt policy and standards for park land dedication and required improvements.**

Provision of recreational facilities is outside the realm of impact fees and within the authority of the planning commission to require as a part of the subdivision process. A policy on park land dedications and improvements should be adopted by the City and County. Such a policy should create land dedication per dwelling unit, or require a fee in lieu of land. The policy should establish a threshold above which land is desired and require a fee in lieu of land for development below the threshold.

- The City Council and County Commission should adopt park land dedication and park improvement policies.
  - Plan and policy should make parks accessible to all, set park standards, and provide an equitable method for providing for land and improvements to neighborhood, community and regional parks.
- Once the City Council and County Commission have adopted a plan and policy, MPC should amend the subdivision regulations to require park land dedication, or fee in lieu of land dedication, and a requirement or fee to provide adequate park improvements in accordance with adopted policies.
- Once the City Council and County Commission have adopted a plan and policy, City and County Parks and Recreation departments should amend their practices to provide adequate park improvements in accordance with adopted policies.



## ZONING ORDINANCE CHANGES TO PROMOTE ACTIVE LIVING

### ✓ PLANNING AND POLICY OPPORTUNITY

#### **Create opportunities for a mix of residential, shopping and service uses within zone districts.**

Neighborhoods are not the same thing as subdivisions. A neighborhood should be a place where people can live, work, play, learn and socialize. It should include a mix of housing, working, recreation, and civic uses. Single-purpose zoning districts, with a district for houses, a district for apartments, a district for offices, and a district for shopping centers, induce urban sprawl, make areas vulnerable to changing market trends, lead to reliance on the motor vehicle for mobility, contribute to excessive pollution and dramatically inhibit active living. Narrowly defined single-purpose zoning districts are the antithesis of smart growth. Neighborhoods that provide opportunities for a mix of properly scaled housing, shops and civic uses have proven to be sustainable and contribute to the safety and sense of place that lead to active, walkable communities.

- The City Council and County Commission should amend their zoning ordinances to encourage mixed-use development through the creation of mixed-use zone districts, zoning incentives to encourage mixed uses, and redevelopment of existing places through mixed-use development.

### ✓ PLANNING AND POLICY OPPORTUNITY

#### **Parking requirements should be analyzed to reduce the required number of spaces, encourage shared parking, provide cross-access easements and improve accommodations of pedestrians and bicyclists within parking areas.**

Parking standards developed to support a single-use zoning strategy undermine urban development and active living, while constraining attempts to create more walkable places. Parking should be shared by multiple users, connected across properties and designed to accommodate the passage of pedestrians and bicyclists from the street to the destination. It should be located to minimize distance between the street and destinations. Addressing parking area design is a significant way to enhance the pedestrian experience in our streets and encourage more active living.

- The City Council and County Commission should engage MPC to analyze the minimum parking requirements within their zoning ordinances and reduce them (or replace them with parking maximums) wherever possible.
- The parking requirements should be reduced dramatically in prime urban redevelopment areas and generally for many large-scale commercial land uses.
- The parking requirements should be modified to acknowledge shared parking and on-street parking opportunities to reduce off-street parking requirements.
- The City and County should consider policies to require cross-access easements in an effort to manage access to arterial and collector streets.
- The City and County should consider requiring pedestrian and bicycle accommodations and amenities in parking area design to enhance the pedestrian and bicycling environment and encourage more active living.

✓ **PLANNING AND POLICY OPPORTUNITY**

**Access management within the parking and driveway standards should be updated with best management practices.**

Maximizing access to commercial development is the driving force in determining the number and configuration of driveway connections to public streets. Managing that access is a role the City and County should take on.

Excessive driveways along arterial and collector streets not only contribute to traffic congestion and hazards, but diminish the pedestrian experience and decrease the likelihood of walking. Access management can play a vital role in making our streets safer for motorists, bicyclists and pedestrians.

- The City and County should adopt access management policies that provides an access classification system, identifies the requirements for access management studies when developing, and lists accepted best practices of access management.
- The City and County zoning ordinances, land development and best management practice manuals and MPC's subdivision regulations should be amended in accordance with adopted access management policy.

✓ **PLANNING AND POLICY OPPORTUNITY**

**Landscaping regulations should be updated.**

Landscaping along streets and within parking areas is a visual tool to manage traffic as it moves from the street to parking areas and within parking areas. It is also an important aspect of pedestrian and bicycling safety and comfort. Landscaping can encourage more active living by calming traffic and enhancing the pedestrian experience.

- The City and County zoning ordinances should be amended to require appropriate landscaping along the street as well as around and within parking areas.



## ZONING ORDINANCE CHANGES TO PROMOTE HEALTHY EATING



### PLANNING AND POLICY OPPORTUNITY

#### **Create a new County Agricultural Zone District and a new Rural Residential Zone District to replace the old Agricultural District.**

Separating the County's current Agricultural zone district into a new Agriculture district and a new Rural Residential district will eliminate many of the inherent conflicts built into the permitted uses and regulations of the current district. Creating a larger minimum lot size for a new Agricultural district will preserve more valuable farm land and open space. By allowing conservation subdivisions, the development value of land can be maintained while protecting valuable open space through the subdivision requirements. A new Rural Residential district can minimize the conflicts between the wide varieties of permitted uses now allowed within the current Agricultural district.

- This effort could be initiated by County Commission with a request to MPC, along with adequate resources, to add this item to its annual work program.



### PLANNING AND POLICY OPPORTUNITY

#### **Create new Conservation Subdivision regulations in the zoning ordinance and require their use in a new County Agricultural District and new Rural Residential District.**

A Conservation Subdivision ordinance allows a development scenario that can create desired residential development while preserving rural character, provide an opportunity to protect valuable farm lands, and create space for use as community gardens. This type of development can also

increase values of homes and reduce costs of required infrastructure by minimizing developed areas and setting aside essential wooded hillsides and ridgetops, which is often the most expensive land to develop.

- This effort could be initiated by County Commission with a request to MPC, along with adequate resources, to add this item to its annual work program.



### PLANNING AND POLICY OPPORTUNITY

#### **Create definitions for urban agriculture practices and make them a use by right in all City and County zone districts.**

Many cities are turning to agriculture to rescue them from decades of urban and suburban malaise. In some cities, where large tracts of land have been abandoned and vacated, farming comparable to what is found in rural areas is being encouraged. In others, a small-scaled, more urban agriculture is being practiced through such uses as the keeping of domestic animals, community gardening and neighborhood-oriented food stands, and farmers markets are being allowed so that all people can grow and distribute fresh food products in all places.

- This effort could be initiated by City Council and County Commission with a request to MPC, along with adequate resources, to add this item to its annual work program.



## ADDRESSING SPECIFIC ISSUES WITH ACTIONS

SIDEWALKS			
Initiator	Action	Tool	Outcome
Legislative Body	Adopt sidewalk plan and policy	Plan & Policy	Sidewalk Plan and Policy
Legislative Body	Amend ordinances to include sidewalk requirements and standards for qualifying expansions of existing development	Zoning Ordinance	Sidewalk requirements and standards for expansions of existing development
MPC	Amend regulations to include sidewalk requirements and standards for new subdivisions	Subdivision Regulations	Sidewalk requirements and standards for new subdivisions
City & County Engineering Departments	Amend practices to include sidewalk requirements and standards for new subdivisions and other development	Land Development and BMP Manuals	Sidewalk requirements and standards
Legislative Body	Increase resources for sidewalks in developed areas	CIP	More resources to build sidewalks
Legislative Body	Dedicate resources to be used as an incentive for neighborhoods to create improvement districts to build sidewalks	CIP and Special Improvement District	Leveraged public resources to build sidewalks

COMPLETE STREETS			
Initiator	Action	Tool	Outcome
Legislative Body	Adopt complete streets policy and standards	Policy & Standards	Complete streets policy and standards
Legislative Body	Amend ordinances to include complete street requirements and standards for qualifying expansions of existing development	Zoning Ordinance	Complete street requirements and standards for expansions of existing development
MPC	Amend regulations to include complete street standards for new subdivisions	Subdivision Regulations	Complete street requirements and standards for new subdivisions
City & County Engineering Departments	Amend practices to include complete street standards	Land Development and BMP Manuals	Sidewalk requirements and standards
Legislative Body	Increase resources to rebuild streets to conform to Complete Streets standards	CIP	More resources to rebuild complete streets

PARK LAND DEDICATION AND PARK IMPROVEMENTS			
Initiator	Action	Tool	Outcome
Legislative Body	Adopt park land dedication and park improvement policies	Policy & Standards	Park land dedication policy and park improvement standards
Legislative Body	Amend ordinances to include park land dedication and park improvement requirements and standards	Zoning Ordinance	Park land dedication and park improvement requirements and standards
MPC	Amend regulations to include park land dedication and park improvement standards for new subdivisions	Subdivision Regulations	Park land dedication requirements and park improvement standards for new subdivisions
City & County Parks and Recreation Departments	Adopt practices to provide park improvements in accordance with adopted policy	Park Improvement Policy	Park improvement standards
Legislative Body	Increase resources available in the Capital Improvements Program to improve parks to conform to adopted standards	CIP	More resources to improve parks

TRAFFIC CALMING IMPROVEMENTS			
Initiator	Action	Tool	Outcome
Legislative Body	Engage MPC or consultant to draft traffic calming policy and standards for approval by City and County	Policy & Standards	Traffic calming policy and standards
Legislative Body	Amend zoning ordinances to include traffic calming requirements and thresholds for expansion of existing developments	Zoning Ordinance	Traffic calming requirements and standards for expansions of existing development
MPC	Amend subdivision regulations to include traffic calming requirements and standards for new subdivisions	Subdivision Regulations	Traffic calming requirements and standards for new subdivisions
City & County Engineering Departments	Amend land development and best management practice manuals to include traffic calming requirements and standards	Land Development and BMP Manuals	Traffic calming requirements and standards
Legislative Body	Increase resources available in the Capital Improvements Program to rebuild streets to conform to traffic calming standards	CIP	More resources to provide traffic calming street improvements

STREET, SIDEWALK AND GREENWAY CONNECTIVITY			
Initiator	Action	Tool	Outcome
Legislative Body	Engage MPC or consultant to draft street connectivity policy for approval by City and County	Policy	Street Connectivity Policy
MPC	Enforce the existing requirement for new subdivisions to provide street connections to adjacent undeveloped land	Subdivision Review and Approval	Street right of way available for future street connections
MPC	Amend subdivision regulations to require connections to available street right of way on adjacent land	Subdivision Review and Approval	Street connections to existing streets
MPC	Amend subdivision regulations to require street patterns that achieve a minimum rating on a street connectivity index	Subdivision Review and Approval	Street patterns that are highly connected
MPC	Amend subdivision regulations to require pedestrian and bicycle connections to existing facilities	Subdivision Review and Approval	Expansion of the pedestrian and bicycle networks
MPC	Require easements for greenway facilities in accordance with Parks, Recreation and Greenway Plan	Subdivision Review and Approval	Potential expansion of greenway network
Legislative Body	Increase resources available in the Capital Improvements Program to reconnect streets in accordance with adopted policy	CIP	More connectivity within the street network
Legislative Body	Increase resources available in the Capital Improvements Plans for sidewalk and greenway connections in developed areas	CIP	More resources to close gaps in sidewalk and greenway networks

NEW ZONING DISTRICTS			
Initiator	Action	Tool	Outcome
Legislative Body	Engage MPC or consultant to analyze zoning ordinance and recommend ways to encourage a greater mix of uses in appropriate areas	Zoning Ordinance	More Mixed-Use Zone Districts
County Commission	Engage MPC or consultant to analyze current Agricultural zone district and make a recommendation regarding the creation of two alternative districts: Agriculture and Rural Residential	Zoning Ordinance	Creation of new Agriculture and Rural Residential zone districts

NEW ZONING REGULATIONS			
Initiator	Action	Tool	Outcome
Legislative Body	Engage MPC or consultant to draft conservation subdivision regulations	Zoning Ordinance	Conservation Subdivision Regulations
Legislative Body	Engage MPC or consultant to draft urban agriculture definitions and recommend appropriate regulations	Zoning Ordinance	Urban Agriculture Uses and Regulations
Legislative Body	Engage MPC or consultant to draft revised parking regulations	Zoning Ordinance	Revised Parking Standards
Legislative Body	Engage MPC or consultant to draft access management regulations	Zoning Ordinance	Access Management Regulations
Legislative Body	Engage MPC or consultant to draft revised landscaping requirements related to street frontage and parking areas	Zoning Ordinance	Revised Landscaping Requirements

# Appendix A:

## Smart Growth

### SMART GROWTH

Text from: [www.smartgrowth.org](http://www.smartgrowth.org)

#### Smart Growth Overview

In communities across the nation, there is a growing concern that current development patterns—dominated by what some call “sprawl”—are no longer in the long-term interest of our cities, existing suburbs, small towns, rural communities, or wilderness areas.

Though supportive of growth, communities are questioning the economic costs of abandoning infrastructure in the city, only to rebuild it further out. They are questioning the social costs of the mismatch between new employment locations in the suburbs and the available work-force in the city. They are questioning the wisdom of abandoning “brownfields” in older communities, eating up the open space and prime agricultural lands at the suburban fringe, and polluting the air of an entire region by driving farther to get places.

Spurring the smart growth movement are demographic shifts, a strong environmental ethic, increased fiscal concerns, and more nuanced views of growth. The result is both a new demand and a new opportunity for smart growth.

Smart growth recognizes connections between development and quality of life. It leverages new growth to improve the community. The features that distinguish smart growth in a community vary from place to place. In general, smart growth invests time, attention, and resources in restoring community and vitality to center cities and older suburbs. New smart growth is more town-centered, is transit and pedestrian oriented, and has a greater mix of housing, commercial and retail uses. It also preserves open space and many other environmental amenities.

But there is no “one-size-fits-all” solution. Successful communities do tend to have one thing in common—a vision of where they want to go and of what things they value in their community—and their plans for development reflect these values.<sup>1</sup>

### Principles of Smart Growth

#### Create Range of Housing Opportunities and Choices

Providing quality housing for people of all income levels is an integral component in any smart growth strategy.

#### Create Walkable Neighborhoods

Walkable communities are desirable places to live, work, learn, worship and play, and therefore a key component of smart growth.

#### Encourage Community and Stakeholder Collaboration

Growth can create great places to live, work and play—if it responds to a community’s own sense of how and where it wants to grow.

#### Foster Distinctive, Attractive Communities with a Strong Sense of Place

Smart growth encourages communities to craft a vision and set standards for development and construction which respond to community values of architectural beauty and distinctiveness, as well as expanded choices in housing and transportation.

#### Make Development Decisions Predictable, Fair and Cost Effective

For a community to be successful in implementing smart growth, it must be embraced by the private sector.

#### Mix Land Uses

Smart growth supports the integration of mixed land uses into communities as a critical component of achieving better places to live.

#### Preserve Open Space, Farmland, Natural Beauty and Critical Environmental Areas

Open space preservation supports smart growth goals by bolstering local economies, preserving critical environmental areas, improving our communities quality of life, and guiding new growth into existing communities.

**Provide a Variety of Transportation Choices**

Providing people with more choices in housing, shopping, communities, and transportation is a key aim of smart growth.

**Strengthen and Direct Development Towards Existing Communities**

Smart growth directs development towards existing communities already served by infrastructure, seeking to utilize the resources that existing neighborhoods offer, and conserve open space and irreplaceable natural resources on the urban fringe.

**Take Advantage of Compact Building Design**

Smart growth provides a means for communities to incorporate more compact building design as an alternative to conventional, land consumptive development.

**Overview of Issue Areas**

The Smart Growth Network website organizes specific topics of smart growth into 7 issue areas.

**Community Quality of Life**

Smart growth offers a framework to build community and help create and preserve a sense of place. It does this through housing and transportation choices, urban green spaces, recreational and cultural attractions, and policies and incentives that promote mixed-use neighborhoods.

**Design**

Smart growth creates communities that offer health, social, economic, and environmental benefits for all. It achieves this by promoting resource-efficient building and community designs, green building practices, low-impact development, and mixed-use and walkable neighborhoods.

**Economics**

Smart growth encourages community-based small business investment and development, adds to the variety of local employment opportunities, and helps attract new businesses and industries. More efficient government services are key to this, as are public and private investments that focus on quality of life improvements.

**Environment**

Many of our current environmental challenges—air and water pollution, global warming, habitat fragmentation and conversion—are due in part

to the way we have built our neighborhoods, communities, and metropolitan areas during the past half-century.

**Health**

Smart growth reduces health threats from air and water pollution and indoor air contaminants through resource-efficient building design and offering transportation options such as mass transit, bike lanes, and pedestrian walkways. These engage residents and workers in a more active, healthy lifestyle.

**Housing**

Smart growth promotes housing options for diverse lifestyles and socio-economic levels. It does this through mixed-use, affordable housing and compact development that revitalizes neighborhoods and provides an alternative to automobile-dependent communities.

**Transportation**

Smart growth protects public health and environmental quality, conserves energy, and improves the quality of life in communities by promoting new transportation choices and transit-oriented development.

1. Executive Summary of *Why Smart Growth: A Primer*, International City/County Management Association with Geoff Anderson, 7/98.

## Appendix B:

# Policies, Ordinances, and Methods of Analysis

### COMPLETE STREETS

Text from: [www.completestreets.org](http://www.completestreets.org)

The National Complete Streets Coalition has identified ten elements of a comprehensive complete streets policy, as discussed below.

An ideal complete streets policy:

- Includes a **vision** for how and why the community wants to complete its streets
- Specifies that ‘**all users**’ includes pedestrians, bicyclists and transit passengers of all ages and abilities, as well as trucks, buses and automobiles.
- Encourages **street connectivity** and aims to create a comprehensive, integrated, connected network for all modes
- Is adoptable by **all agencies to cover all roads**
- Applies to **both new and retrofit projects**, including design, planning, maintenance, and operations, for the entire right of way
- Makes **any exceptions** specific and sets a clear procedure that requires high-level approval of exceptions.
- Directs the use of the **latest and best design criteria** and guidelines while recognizing the need for flexibility in balancing user needs
- Directs that complete streets solutions will **complement the context** of the community.
- Establishes **performance standards** with measurable outcomes
- Includes **specific next steps** for implementation of the policy

#### Sets a Vision

A strong vision can inspire a community to follow through on its complete streets policy. Just as no two policies are alike, visions are not one-size-fits-all either. In the small town of Decatur, GA, the Community Transportation Plan defines their vision as promoting health through physical activity and active transportation. In the City of Chicago, the Department of Transportation focuses on creating streets safe for travel by even

the most vulnerable—children, older adults, and those with disabilities.

#### Specifies All Users

A true complete streets policy must apply to everyone traveling along the road. A sidewalk without curb ramps is useless to someone using a wheelchair. A street with an awkwardly placed public transportation stop without safe crossings is dangerous for riders. A fast-moving road with no safe space for cyclists will discourage those who depend on bicycles for transportation. A road with heavy freight traffic must be planned with those vehicles in mind. Older adults and children face particular challenges as they are more likely to be seriously injured or killed along a roadway. Automobiles are an important part of a complete street as well, as any change made to better accommodate other modes will have an effect on personal vehicles too. In some cases, like the installation of curb bulb-outs, these changes can improve traffic flow and the driving experience.

#### Creates a Network

Complete streets policies should result in the creation of a complete transportation network for all modes of travel. A network approach helps to balance the needs of all users. Instead of trying to make each street perfect for every traveler, communities can create an interwoven array of streets that emphasize different modes and provide quality accessibility for everyone. This can mean creating bicycle boulevards to speed along bicycle travel on certain low-traffic routes; dedicating more travel lanes to bus travel only; or pedestrianizing segments of routes that are already overflowing with people on foot. It is important to provide basic safe access for all users regardless of design strategy and networks should not require some users to take long detours.

#### All Agencies and All Roads

Creating complete streets networks is difficult because many agencies control our streets. They are built and maintained by state, county, and local agencies, and private developers often build

new roads. Typical complete streets policies cover only one jurisdiction's roadways, which can cause network problems: a bike lane on one side of a bridge disappears on the other because the road is no longer controlled by the agency that built the lane. Another common issue to resolve is inclusion of complete streets elements in sub-division regulations, which govern how private developers build their new streets.

### **All Projects**

For many years, multi-modal streets have been treated as 'special projects' requiring extra planning, funding, and effort. The complete streets approach is different. Its intent is to view all transportation improvements as opportunities to create safer, more accessible streets for all users, including pedestrians, cyclists, and public transportation passengers. Under this approach, even small projects can be an opportunity to make meaningful improvements. In repaving projects, for example, an edge stripe can be shifted to create more room for cyclists. In routine work on traffic lights, the timing can be changed to better accommodate pedestrians walking at a slower speed. A strong complete streets policy will integrate complete streets planning into all types of projects, including new construction, reconstruction, rehabilitation, repair, and maintenance.

### **Exceptions**

Making a policy work in the real world requires developing a process to handle exceptions to providing for all modes in each project. The Federal Highway Administration's guidance on accommodating bicycle and pedestrian travel named three exceptions that have become commonly used in complete streets policies: 1) accommodation is not necessary on corridors where non-motorized use is prohibited, such as interstate freeways; 2) cost of accommodation is excessively disproportionate to the need or probable use; 3) a documented absence of current or future need. Many communities have included their own exceptions, such as severe topological constraints. In addition to defining exceptions, there must be a clear process for granting them, where a senior-level department head must approve them. Any exceptions should be kept on record and publicly-available.

### **Design Criteria**

Communities adopting a complete streets policy should review their design policies to ensure their ability to accommodate all modes of travel, while

still providing flexibility to allow designers to tailor the project to unique circumstances. Some communities will opt to re-write their design manual. Others will refer to existing design guides, such as those issued by AASHTO, state design standards, and the Americans with Disabilities Act Accessibility Guidelines.

### **Context-Sensitive**

An effective complete streets policy must be sensitive to the community context. Being clear about this in the initial policy statement can allay fears that the policy will require inappropriately wide roads in quiet neighborhoods or miles of little-used sidewalks in rural areas. A strong statement about context can help align transportation and land use planning goals, creating livable, strong neighborhoods.

### **Performance Measures**

The traditional performance measure for transportation planning has been vehicular Level of Service (LOS) – a measure of automobile congestion. Complete streets planning requires taking a broader look at how the system is serving all users. Communities with complete streets policies can measure success through a number of ways: the miles of on-street bicycle routes created; new linear feet of pedestrian accommodation; changes in the number of people using public transportation, bicycling, or walking (mode shift); number of new street trees; and/or the creation or adoption of a new multi-modal Level of Service standard that better measures the quality of travel experience. The fifth edition of Highway Capacity Manual, due out in 2010, will include this new way of measuring LOS. Cities like San Francisco and Charlotte have already begun to develop their own.

### **Implementation**

Taking a complete streets policy from paper into practice is not easy, but providing some momentum with specific implementation steps can help. Some policies establish a task force or commission to work toward policy implementation. There are four key steps for successful implementation: 1) Restructure procedures to accommodate all users on every project; 2) Develop new design policies and guides; 3) Offer workshops and other training opportunities to planners and engineers; and 4) Institute better ways to measure performance and collect data on how well the streets are serving all users.

## SAFE ROUTES TO SCHOOL

Text from: [www.saferoutesinfo.org](http://www.saferoutesinfo.org)

### Overview

Safe Routes to School (SRTS) programs are sustained efforts by parents, schools, community leaders and local, state, and federal governments to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school.

SRTS programs examine conditions around schools and conduct projects and activities that work to improve safety and accessibility, and reduce traffic and air pollution in the vicinity of schools. As a result, these programs help make bicycling and walking to school safer and more appealing transportation choices thus encouraging a healthy and active lifestyle from an early age.

### Defining Safe Routes to School

#### What are Safe Routes to School Programs?

Safe Routes to School (SRTS) programs are sustained efforts by parents, schools, community leaders and local, state, and federal governments to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school.

SRTS programs examine conditions around schools and conduct projects and activities that improve safety and reduce traffic and air pollution in the vicinity of schools. As a result, these programs make bicycling and walking to school a safer and more appealing transportation choice thus encouraging a healthy and active lifestyle from an early age.

#### Why is a program like Safe Routes to School needed?

Residents of communities today struggle with motor vehicles clogging roads, motor vehicle emissions polluting the environment and more children engaging in less physical activity and growing overweight.

The implications of SRTS can be far-reaching. Safe Routes programs can improve safety not just for children, but for a community of pedestrians and bicyclists. They provide opportunities for people to become more physically active and to rely less on their cars. Programs benefit the environment and a community's quality of life by reducing traffic congestion and motor vehicle emissions.

### How does a school start a Safe Routes to School Program?

Each school starts Safe Routes programs with different circumstances. Some schools have great places for walking and bicycling but few students taking advantage of it. Other communities have children walking and bicycling to school in unsafe conditions or along poorly maintained routes, while some communities do not have children walking or bicycling to school at all.

Successful Safe Routes programs involve the whole community. Parents, children, neighborhood groups, schools, law enforcement officers, community leaders and transportation and public health professionals help identify the issues and solutions.

While every community is unique, the basic steps to starting a Safe Routes to School program include:

#### 1. Bring together the right people:

Identify people who want to make walking and bicycling to school safe and appealing for children. Sharing concerns, interests and knowledge among a variety of community members with diverse expertise can enable groups to tackle many different issues.

#### 2. Hold a kick-off meeting:

The kick-off meeting has two main goals—to create a vision and generate next steps.

#### 3. Gather information and identify issues:

Collecting information can help to identify needed program elements and provide a means to measure the impact of the program later

#### 4. Identify solutions:

Solutions to issues identified by the group will include a combination of education, encouragement, engineering and enforcement strategies.

#### 5. Make a plan:

The SRTS plan does not need to be lengthy but should include education, encouragement, engineering and enforcement strategies, a time schedule, a map of the area covered by the plan and an explanation of how the program will be evaluated.

#### 6. Get the plan and people moving:

There are things that can be done right away without major funding, so some parts of the SRTS plan can start right away while waiting on other parts.

#### 7. Evaluate, adjust and keep going:

After the program begins, careful monitoring will identify which strategies are working well and which are not going as planned.

### **What types of activities are typically a part of Safe Routes to School programs?**

Successful Safe Routes programs may include policy development, planning and implementation of strategies such as improvements to streets and sidewalks, education and encouragement of children and parents, and increased enforcement of traffic laws. Programs can include:

- Walkability and bikeability audits of the safety of streets around schools
- Programs to improve sidewalk conditions near schools
- Use of traffic calming devices to slow traffic and give pedestrians priority
- Programs that educate children on walking and biking safely, and challenge them to walk or bike often
- “Walking school buses” in which one or two parents or volunteers escort a group of children on the walk to school
- Increased traffic enforcement around schools
- School construction that includes renovation and improvement of existing schools, and locating new schools to reduce walking hazards and avoid major traffic threats
- Cooperation among school officials, law enforcement officials, and transportation planners.

### **Improving Safety**

Walking and bicycling need to be safe transportation options which means creating safe environments and teaching safety skills to walkers, bicyclists and drivers.

#### **What do safe walking and bicycling environments include?**

- Neighborhood schools that are within walking and bicycling distance from homes
- Sidewalks or bike-paths that connect homes with schools
- Improved opportunities to cross streets (such as the presence of adult crossing guards, raised medians or traffic and pedestrian signals)
- Slow vehicle speeds accomplished through roadway safety measures (traffic calming) and/or police enforcement where needed

#### **Safety education includes working with:**

- Children - to provide them with basic safety education, such as how to cross streets, obey crossing guards and be visible to drivers.
- Parents - to create awareness of the need for pedestrian and bicyclist safety education and

opportunities to walk and bike and by practicing safety skills with their children.

- Drivers - to alert all drivers to the presence of walkers and bicyclists and the need to slow down.
- Law enforcement - to enhance pedestrian and bicyclist safety with school zone enforcement.
- Local officials - to identify changes needed to improve walking and bicycling conditions around schools.

### **Trends in School Travel**

#### **How many kids walk or bike to school?**

While we do not know the exact number of kids that walk and bike to school, what we do know is that fewer children walk or bike to school than did so a generation ago.

- In 2001, less than 16 percent of students between the ages of 5 and 15 walked or biked to or from school.
- In 1969, 42 percent of students walked or biked to school.<sup>i</sup>

This is an opportunity lost. Walking or biking to school gives children time for physical activity and a sense of responsibility and independence; allows them to enjoy being outside; and provides them with time to socialize with their parents and friends and to get to know their neighborhoods.

#### **Why have we seen a decrease in children walking and bicycling to school?**

The circumstances that have led to a decline in walking and bicycling to school did not happen overnight and have created a self-perpetuating cycle. As motor vehicle traffic increases, parents become more convinced that it is unsafe for their children to walk or bicycle to school. They begin driving them to school, thereby adding even more traffic to the road and sustaining the cycle. Understanding the many reasons why so many children do not walk or bicycle to school is the first step in interrupting the cycle.

Many factors contribute to the reduction in children walking and bicycling to school. The U.S. Centers for Disease Control and Prevention (CDC) has published the findings from two nationwide surveys of parents which identify barriers that prevent them from allowing their children to walk to school.

In the 2004 survey, 1,588 adults answered questions about barriers to walking to school for their youngest child aged 5 to 18 years. Parents cited one or more of the following six reasons.

Barrier	Percent of parents identifying with the barrier
Distance to school	61.5 %
Traffic-related danger	30.4 %
Weather	18.6 %
Crime danger	11.7 %
Opposing school policy	6.0 %
Other reasons (not identified)	15.0 %

### What are the health benefits of kids walking and bicycling to school?

Two recent studies have found that walking to school is associated with higher overall physical activity throughout the day.<sup>2,3</sup> There are many potential benefits of physical activity for youth including:<sup>4,5</sup>

- Weight and blood pressure control
- Bone, muscle, and joint health and maintenance
- Reduction in the risk of diabetes
- Improved psychological welfare
- Better academic performance<sup>6,7</sup>

The walk to school can provide opportunities for physical activity, as well as time outdoors and near nature. Exposure to nature and free outdoor play can have multiple health benefits including stress reduction, relief of ADHD symptoms in children, and increased cognitive and motor functioning.<sup>8,9,10,11</sup>

### How can Safe Routes to School affect traffic surrounding the school?

As much as 26 percent of morning traffic can be school-related.<sup>12,13</sup> Travel to school accounts for 7 to 11 percent of non-commuting vehicle traffic.<sup>14</sup> This figure does not include trips during which parents drop their children off on the way to work, so the actual proportion of school-related traffic is likely much higher.

Traffic can lead to even less walking or biking. As more children are driven, more parents become convinced that traffic conditions make it unsafe for walking or bicycling and they join the line of cars at the school.

If more children walked or biked to school, it would reduce the number of cars near the school at pick-up and drop-off times making it safer for walkers and bicyclists and reducing traffic congestion.

## Environment and Air Quality

### What are the potential environmental impacts of Safe Routes to School?

Private vehicle emissions contribute to air pollution and global climate change, both of which threaten human and environmental health. Passenger cars, trucks, motorcycles, and SUVs together account for 62 percent of transportation-related greenhouse gas emissions.<sup>15</sup> The transportation sector is responsible for one third of all carbon dioxide emissions in the US.<sup>16</sup>

Air pollutants can be especially harmful to children because their respiratory systems are still developing.

- Air pollution has negative effects on lung development in children and can reduce lung function, increase respiratory infection, and aggravate asthma symptoms.<sup>17</sup>
- Childhood asthma rates more than doubled from 1980 to the mid-1990s and they remain at historically high rates today. Presently, asthma is one of the most prevalent chronic childhood diseases and is a major cause of childhood disability.<sup>18</sup>
- At least 14 million school days are missed annually due to asthma.<sup>19</sup>

Schools placed in neighborhoods near residential areas with a good street and sidewalk network have more students arriving by bicycle and on foot. Air quality is measurably better at such locations.<sup>20</sup>

Walking and biking to school provide opportunities for children and families to reduce their carbon usage and contribute to the health of the environment.

- If a family chooses to walk to school (rather than drive a personal vehicle) they can reduce their carbon use by .164 metric tons annually. If half of the students at an average size elementary school choose to walk to school their impact could be a savings of over 39 tons of greenhouse gas emissions a year.<sup>21</sup> This is the equivalent of the carbon-removing abilities of 1000 trees.<sup>22</sup>
- Leaving the car at home just two days a week will reduce greenhouse gas emissions by an average of 1,600 pounds per year.<sup>23</sup>

## History of Safe Routes to School

### How did the Safe Routes to School concept start?

The term “Safe Routes to School” was first used in Denmark in the late 1970s as part of a very successful initiative to reduce the number of children killed while walking and bicycling to school. Safe Routes to School spread internationally, with programs springing up in throughout Europe, in Australia, New Zealand, Canada, and the United States.

The first modern Safe Routes to School program in the U.S. began in 1997 in the Bronx, NY. In 1998, Congress funded two pilot SRTS programs through the National Highway Traffic Safety Administration. NHTSA issued \$50,000 each for Safe Routes to School pilot programs in Marin County, California and Arlington, Massachusetts. Within a year after the launch of the pilot programs, many other grassroots Safe Routes to School efforts were started throughout the United States.

As word spread in the pedestrian and bicyclist community of success with the NHTSA pilot programs, interest in a broader program grew. In July 2005, Congress passed federal legislation that established a national Safe Routes to School program. The program, which was signed into law in August 2005, will dedicate a total of \$612 million towards SRTS from 2005 to 2009. These funds will be distributed to states based on student enrollment, with no state receiving less than \$1 million per year. SRTS funds can be used for both infrastructure projects and non-infrastructure activities. The legislation also requires each state to have a Safe Routes to School Coordinator to serve as a central point of contact for the state.

With the new federal Safe Routes to School program, there will be a significant increase in funds and institutional support to implement SRTS programs in states and communities across the country. So a new chapter in the history of Safe Routes to School programs might soon be written as the benefits of communities and states establishing and advancing Safe Routes programs and issues are learned.

## WALKABLE COMMUNITIES

Text from: [www.walkable.org](http://www.walkable.org)

### What makes a community walkable?

Walkable Communities has a 12 step checklist for defining, achieving, or strengthening a walkable community. Walkable Communities have (in no particular order):

**1. Intact town centers.** This center includes a quiet, pleasant main street with a hearty, healthy set of stores. These stores are open for business a minimum of 8 hours a day. The stores include things like hairdressers, hardware, druggist, small grocery/deli, good restaurants, clothing, variety store, ice cream shop, stores that attract children, many youth and senior services, places to conduct civic and personal business, library, all within a 1/4 mile walk (5 minutes) of the absolute center. If this is a county seat, the county buildings are downtown. If this is an incorporated town the town hall is in the town center. The library is open for business at least 10 hours a day 6-7 days a week. A post office is located downtown.

**2. Residential densities, mixed income, mixed use.**

Near the town center, and in a large town at appropriate transit locations, there will be true neighborhoods. Higher densities are near the town center and in appropriate concentrations further out. Housing includes mixed income and mixed use. A truly walkable community does not force people to drive to where they work. Aspen, for example, is a great place to shop and play, but fails to provide housing for anyone who works there.

Granny flats, design studios, and other affordable housing are part of the mix in even the wealthiest neighborhoods.

**3. Public space.** There are many places for people to assemble, play, and associate with others within their neighborhood. The best neighborhoods have welcoming public space within 1/8 mile (700 feet) of all homes. These spaces are easily accessed by all people.

**4. Universal design.** The community has a healthy respect for people of all abilities, and has appropriate ramps, medians, refuges, crossings of driveways, sidewalks on all streets where needed, benches, shade, and other basic amenities to make walking feasible and enjoyable for everyone.

**5. Key streets are speed controlled.** Traffic moves on main streets and in neighborhoods at

safe, pleasant, courteous speeds. Most streets are designed to keep speeds low. Many of these streets are tree lined, have on-street parking, and use other affordable methods to keep traffic speeds under control. There is an absence of one-way couplets designed to flush the downtown of its traffic in a rush or flight to the suburbs. In most parts of the nation the streets are also green, or have other pleasant landscaping schemes in dry climates.

**6. Streets & trails are well linked.** The town has a good block form, often in a grid or other highly connected pattern. Although hilly terrain calls for slightly different patterns, the linkages are still frequent. Some of the newer neighborhoods that were built to cul-de-sac or other fractured patterns are now being repaired for walking by putting in trail connectors in many places. These links are well designed so that there are many eyes on these places. Code for new streets no longer permits long streets that are disconnected.

**7. Design is properly scaled to 1/8, 1/4, and 1/2 mile radius segments.** From most homes it is possible to get to most services in 1/4 mile (actual walked distance). Neighborhood elementary schools are within a 1/4 mile walking radius of most homes, while high schools are accessible to most children (1 mile radius). Most important features (parks) are within 1/8 mile, and a good, well designed place to wait for a high frequency (10-20 minutes) bus is within 1/4 to 1/2 mile. Note that most of these details can be seen on a detailed local map.

**8. The town is designed for people.** Look for clues that decisions are being made for people first, cars second. Does the town have a lot of open parking lots downtown? Are many streets plagued with multiple commercial driveways, limited on-street parking, fast turning radii on corners? Towns designed for people have many investments being made in plazas, parks, and walkways. Investments in intersections on the far reaches of town are rare. Towns designed for people are tearing down old, non-historic dwellings and shopping plazas and converting them to compact, mixed use, mixed income properties. Ask to review the past year of building permits by category. Much is told about what percentage of construction that is infill and independent small builder stock versus big builder single price-range housing or retail stock.

**9. The town is thinking small.** The most walkable towns are boldly stepping forward requiring maximum parking allowed, versus minimum

required. Groceries, and other important stores, are not permitted to build above a reasonable square footage, must place the foot print of the structure to the street, etc. Palo Alto, for instance, caps their groceries at 20,000 square feet. This assures that groceries, drug stores, and other important items are competitive at a size that is neighborhood friendly. Neighborhood schools are community centers. Older buildings are rebuilt in place, or converted to modern needs. Most parking is on-street.

**10. In walkable communities there are many people walking.** This sounds like a silly statement at first...but think again. Often there are places that look walkable, but no one walks. Why? There is always a reason. Is it crime? Is there is no place to walk to, even though the streets and walkways are pleasant? Are the downtown stores not open convenient hours? You should be able to see a great diversity of those walking and bicycling. Some will be very young, some very old. People with disabilities will be common. Another clue, where people walk in great abundance virtually all motorists are courteous to pedestrians...hard to believe, but true!

**11. The town and the neighborhoods have a vision.** Seattle, Washington, Portland, Oregon and Austin, Texas are just three examples where neighborhood master plans have been developed. Honolulu sets aside about \$1M of funds per year to be spent by each neighborhood. Visionary master plans provide direction, build ownership of citizens, engage diverse people, and create opportunities for implementation. A well thought out master plan gets past sticky issues, and deals with the most basic, fundamental, necessary decisions and commitments. There are budgets set aside for neighborhoods, for sidewalks, trails, links, and parks. The community no longer talks about where they will get the money, but how they will change their priorities.

**12. Decision-makers are visionary, communicative, and forward-thinking.** The town has a strong majority of leaders who "get it." Leaders know that they are not there to do all the work...but to listen and respond to the most engaged, involved, and broad minded citizens. They are rarely swayed by the anti-group, they seek the opinions and involvement of big brush citizens and retailers. They are purposefully changing and building policies, practices, codes, and decisions to make their towns pleasant places for people...

reinvesting in the town center, disinvesting in sprawl. These people know the difference between a green field, brown field, and gray field. They know what Active Living by Design is all about. The regional government understands and supports the building of a town center, and is not attempting to take funds from the people at the center to induce or support sprawl. Often there is a charismatic leader on the town board, chamber of commerce, or planning board, along with an architectural review team, a historic preservation effort, and overall good public process. Check out the website of the town...if they focus on their golf courses, tax breaks, great medical services, scenic majestic mountains, or proximity to the sea but fail to emphasize their neighborhood schools, world class library, lively downtown, or citizen participation... they are lost, bewitched, and bewildered in their own lust for Walt Disney's Pleasure Island.

## TRAFFIC CALMING

Text from: [www.trafficcalming.org](http://www.trafficcalming.org)

### A Brief History of Traffic Calming

#### European Beginnings

European traffic calming began as a grassroots movement in the late 1960s. Angry residents of the Dutch City of Delft fought cut-through traffic by turning their streets into woonerven, or "living yards." This was followed by the development of European slow streets (designed for 30 kph or 20 mph) in the late 1970s; the application of traffic calming principles to intercity highways through small Danish and German towns in the 1980s; and the treatment of urban arterials in areawide schemes, principally in Germany and France, also in the 1980s.

#### An American Take

In the U.S., a version of traffic calming was practiced as early as the late 1960s and early 1970s in such places as Berkeley, CA, Seattle, WA and Eugene, OR. The first national study of traffic calming was completed circa 1980. It explored residential preferences related to traffic, collected performance data on speed humps, and reviewed legal issues.

#### A Body of Experience

Almost 20 years later, with a track record in place, the Federal Highway Administration (FHWA) funded

another study in 1998 which led to the ITE report, *Traffic Calming: State of the Practice*, by Reid Ewing. As compared to the 1980 study, this report goes beyond residential streets to major thoroughfares, beyond speed humps to a toolbox of calming measures, and beyond legal issues to policy, procedural, and political challenges.

### Types of Traffic Calming Measures

Traffic calming measures can be separated into two groups based on the main impact intended. Volume control measures are primarily used to address cut-through traffic problems by blocking certain movements, thereby diverting traffic to streets better able to handle it. Speed control measures are primarily used to address speeding problems by changing vertical alignment, changing horizontal alignment, or narrowing the roadway. The distinction between the two types of measures is not as clear as their names suggest, since speed control measures frequently divert traffic to alternate routes, and volume control measures usually slow traffic.

#### Speed Control Measures:

##### Vertical Deflection

- Speed Humps
- Speed Tables
- Raised Crosswalks
- Raised Intersections
- Textured Pavements
- Speed Lumps
- Speed Cushion
- Split Speed Hump

##### Horizontal Deflection

- Traffic Circles
- Roundabouts
- Chicanes
- Realigned Intersections

##### Horizontal Narrowing

- Neckdowns
- Center Island Narrowings
- Chokers

### Volume Control Measures

#### Divertive, Restrictive

- Full Closures
- Half Closures
- Diagonal Diverters
- Lateral Shift
- Median Barriers

## CONNECTIVITY MEASURES

### Internal Street Connectivity

Literature regarding connectivity lists many benefits of street connectivity. These include shorter travel distances, more route choices, faster emergency response time, more options for temporary detours and reduced traffic congestion on arterial streets. From a public health standpoint, longer travel distances imposed by poorly connected street networks dissuade people from walking or bicycling to their destinations. The reduced traffic on arterial routes also creates corridors that are less intimidating to those who are considering active modes of transportation. Finally, well-connected street networks typically reduce vehicle miles traveled, which in turn reduces air pollution.

Several localities require new developments to meet quantitative connectivity standards that are measured by calculating the connectivity index, which is the number of links divided by the number of nodes. Nodes are either street intersections of road end points, such as dead-ends and cul-de-sacs. Links are road segments that connect nodes. Developments with interconnected streets have higher connectivity indices because they have more links and fewer nodes. Developments with multiple cul-de-sacs have more nodes per link and, therefore, lower connectivity indices. (Some connectivity measures include the node(s) at the entrance(s) when tallying the number of nodes in the development while other regulations do not. The inclusion or exclusion of these nodes can substantially affect the resulting connectivity index.)

Localities that set standards for street connectivity define different ranges of acceptable connectivity. They vary by the intended intensity of development and population densities. In general, the higher the land use intensity or population density, the higher the required connectivity index. Some local governing bodies explicitly exempt areas that are zoned for open space, highway commercial or industrial uses. Municipalities generally recognize a number of constraints that limit a development's ability to achieve the desired connectivity. These include railroad rights-of-way, incompatible adjacent land uses and environmental constraints such as steep slopes, water bodies and wetland.

Street Connectivity Standards		
Locality	Connectivity Index Requirements	Count Entrance Node(s)
Durham, NC	1.15 – 1.4	No
Cary, NC	1.2	Yes
Knightdale, NC1	1.3 – 1.6	Yes
Delaware DOT	1.4	Not specified
Virginia DOT	1.4 - 1.6	Yes, and existing streets connecting to that node
Henderson, NV	1.4 – 1.65	No. Language nearly identical to Franklin, TN. See below.
Orlando, FL <sup>1</sup>	1.4 - 1.8	Yes, and "first link beyond the last node"
Franklin, TN	1.65	Unclear. Language says no, diagram says yes and external links connecting to that node

<sup>1</sup>Model code cited in Ohio-Kentucky-Indiana Regional Council of Governments report

Some argue that increasing connectivity can adversely affect new residential developments. While greater connectivity will typically reduce traffic on arterial routes, some of that traffic may be displaced onto residential streets, especially if the residential street network provides a cut-through between to heavily used routes. However, the use of traffic calming or complete street designs to slow traffic on residential streets and dissuade people from using the residential network for cut-through purposes is a possible remedy.

### External Connectivity

If a development with high internal connectivity only has one intersection with the larger, surrounding street network, it essentially becomes one large cul-de-sac. Hence, external connections are also vital to achieve the community benefits associated with well-connected street networks. Several communities and organization have adopted or recommended codes to ensure transportation connections between developments.

Several localities require the placement of street stubs along the outer boundary of a development so that future development on adjacent land can connect to the available street network. The Cities of Cary, NC, Franklin, TN, and Henderson, NV, require the placement of street stubs every 1,500 feet. The Kentucky Transportation Cabinet (KTC) recommends street stubs every 700 feet. Future adjacent subdivisions are then required to connect with these stubs.

Some communities require a specified number of external connections based on the size of the development. Cary, NC, requires that all subdivisions with more than 100 units have at least two connections to the outside street network. Durham, NC, requires two subdivision connections once the number of units exceeds 91 and three connections when the number of units exceeds 180.

The cities of Franklin and Henderson and the KTC also recognize the need to connect residential areas with adjacent commercial, office, recreation and education locations. They require or recommend that these connections are designed in a manner that do not force those departing the abutting residential areas to utilize arterial streets to reach these destinations.

The cities of Franklin and Henderson and the KTC also note that interconnecting street networks may encourage those who are traveling across a region to inappropriately cut through residential areas that are not designed for such traffic patterns. When this is anticipated, they encourage the use of traffic calming measures. Finally, the KTC recommends that localities ban gated roadways.

## PARK LAND DEDICATION

This model ordinance is from: *21st Century Land Development Code*; Robert H. Freilick, S. Mark White, with Kate F. Murray; published in 2008 by the American Planning Association. Some of the tables are not shown in their entirety for the sake of brevity.

### 5.21 PARKS/OPEN SPACE

Parks and open space provide a valuable asset to the urban form of the [LOCAL GOVERNMENT], its historical development, and the general welfare of its residents.

These standards ensure that parks and open space provide focal points for new communities. A central square or green, for example, may comprise a majority of the area required for dedication.

#### 5.21.1 Applicability

- (A) This section applies to any application for residential subdivision plat approval, unless exempt (refer to subsection (C), below).
- (B) The location and extent of parks/open space or designation of a fee in lieu of park development (refer to § 5.21.4 Fee in Lieu of Park Development (Optional) of this chapter) shall be indicated on any preliminary plat or site plan.
- (C) The provisions of this section do not apply to:
  - 1) A proposed subdivision located within an infill development zone; or
  - 2) A proposed subdivision located within a planning area that has a surplus of neighborhood parks/open space, as designated in the [PARKS AND RECREATION MASTER PLAN], unless the surplus has been eliminated by the subsequent approval of residential dwelling units within the planning area, as measured by the "Required Parks/Open Space" standard established in Table 5-9, Column (B).

Table 5-9: Required Parks/Open Space	
(A) Zoning District or Area	(B) Required Park/ Open Space
"IL" (Industrial Light) "IH" (Industrial Heavy)	Not applicable
"RP" (Resource Protection) "RE" (Residential Estate) "NS" (Neighborhood Suburban) "NU" (Neighborhood Urban) "MX" (Mixed Use) (residential uses) "NP" (Neighborhood Preservation)	900 square feet per dwelling unit
"O" (Office) "CN" (Commercial Neighborhood) "CG" (Commercial General) "CL" (Commercial Large-Scale) "MX" (Mixed Use) (nonresidential uses and mixed-use buildings)	450 square feet per 1,000 gross square feet for buildings exceed- ing 5,000 square feet
"D" (Downtown)	150 square feet per 1,000 gross square feet for buildings exceed- ing 15,000 square feet

### **5.21.2 Required Parks/Open Space**

Required parks/open space shall be reserved for any development in the zoning districts or areas as set forth in Table 5-9.

### **5.21.3 Categories of Parks/Open Space**

The types of park or open space that may be provided to satisfy this chapter are described in Table 5-10. The minimum dimension, improvement, and maintenance requirements shall be consistent with Column (C) of Table 5-10. The applicant may choose among the types of parks or open space to include within the proposed development that is consistent with the overall minimum set-aside requirements of Table 5-10.

#### **5.21.3.1 Exclusions**

The following areas are not considered parks or open space pursuant to this section:

- (A) Areas covered by buildings, parking lots, or other impervious surfaces accessible to automobiles;
- (B) Utility easements, drainage easements, or street rights-of-way, unless such areas are usable for public recreational purposes and will not be permanently converted to a street or trench;
- (C) Land underneath overhead utility lines, except where used for jogging trails, bicycle trails, or parking areas accessory to a park/open space;
- (D) Streets; and
- (E) Ponds or lakes exceeding 2,500 square feet, unless surrounded by an upland area with a minimum width of 25 feet.

#### **5.21.3.2 Excess Capacity**

Any excess capacity of a park or open space provided pursuant to this section may be credited toward the required dedication for another subdivision within a 1- mile radius or a benefit area for fees in lieu of park development, where:

- (A) The subdivision for which the credit is applied is in the same ownership by the same applicant; and
- (B) The park/open space areas are accessible to each subdivision.

### **5.21.4 Fee in Lieu of Park Development** (Optional)

#### **5.21.4.1 Applicability**

In lieu of dedicating and improving park or open space lands as required by this section, the applicant may deposit with the [LOCAL GOVERNMENT] a cash payment in lieu of park development.

#### **5.21.4.2 Amount**

The [PLANNING OFFICIAL] shall determine the amount to be deposited, based on the following formula:  $C + (A \times V) = M$

where:

C = cost of park or open space improvements, as determined by the [PARKS/RECREATION DEPARTMENT];

A = the amount of land required for dedication as determined in § 5.21.2 Required Parks/Open Space of this chapter;

V = fair market value (per acre) of the property to be subdivided, as established by an appraisal; and

M = the number of dollars to be paid in lieu of dedication of land.

#### **5.21.4.3 Fair Market Value**

For purposes of computing fair market value of property, the subdivider may select one of the following fair market value determinations:

- (A) The current fair market value of the land as shown on the records of the tax appraisal district if based upon an appraisal that occurred within two years prior to the application;
- (B) The current fair market value of the land as determined by a qualified real estate appraiser at the subdivider's expense, if the [PLANNING OFFICIAL] certifies that the appraisal fairly reflects the land value;
- (C) The current fair market value of the land as determined by a qualified real estate appraiser employed by the [LOCAL GOVERNMENT]; or
- (D) The actual purchase price of the property as evidenced by a purchase money contract, or a closing statement within one year of the date of application.

#### **5.21.4.4 Reductions**

- (A) The [LOCAL GOVERNMENT] shall reduce the land dedication component of the fee in lieu of parks or open space facilities by the amount of any reasonable costs for any land that has been dedicated to and accepted by the [DEVELOPING ACTIVITY] for park/open space facilities by the applicant within the proposed development, subject to the following:
  - (1) The reasonable costs of the park/open space facilities that have been dedicated shall reduce the fee in lieu of parks or open space due for only the same type of park facility;
  - (2) The unit costs used to calculate the reduction shall not exceed those assumed

as the average costs of the park/open space facilities used to compute the fee in lieu of park development for the benefit area in which the property is located;

- (3) No reduction shall be granted that exceeds the fee in lieu of park development due for the development; and
  - (4) Any reduction created by the dedication of park/open space facilities shall expire 10 years after the date that the offset was created.
- (B) An applicant may apply for a reduction of fee in lieu of park development either at the time of approval of a subdivision plat or at the time of dedication by separate instrument. The applicant may appeal the determination of the [PLANNING OFFICIAL] of parks and recreation concerning the reduction to the [LOCAL GOVERNMENT].
- (C) The amount of the reduction shall be prorated among the number of dwelling units approved for the development unless otherwise agreed to by the [GOVERNING ENTITY].

#### **5.21.4.5 Timing**

Fees in lieu of park and open space development shall be assessed at the time of plat approval and shall be paid at the time of plat recordation.

#### **5.21.4.6 Earmarking**

- (A) All fees collected shall be used for the acquisition or development of land for a neighborhood park, or development or construction of improvements to existing unimproved parkland. The park development or improvement shall be located within 1 mile of the periphery of the proposed subdivision development, or within a park benefit district established by resolution of the [GOVERNING ENTITY]. However, if acquisition opportunities are not available, or existing parkland is already developed or improved within 1 mile of the proposed subdivision development, then areas within 2 miles of the periphery of the proposed subdivision development may be considered for the acquisition of neighborhood parkland and/or construction of improvements to existing parkland within such periphery.
- (B) A special fund is established for the deposit of all fees in lieu of park development. The fund shall be known as the park acquisition and development fund. Within the fund, fees in lieu of park development paid shall be earmarked for expenditure on park improvements in a neighborhood park generally located within

the distance described in subsection (A), above. All fees in lieu of park development paid must be expended within 10 years from the date of receipt for park facilities benefiting the residential subdivision or dwelling unit for which the fees are paid. Fees shall be considered expended if they are spent for acquisition or development, respectively, of neighborhood parks located within 1/2 to 1 mile of the subdivision for which the fees were paid within the 10-year period. If fees are not expended within such period, the then-current owner shall be entitled to a refund of the principal deposited by the applicant in such fund, together with accrued interest. The owner must request such refund in writing within 365 days of entitlement or such right shall be waived. Interest accruing to the parkland dedication fund and to the park development fund shall be expended on neighborhood parkland acquisition and for neighborhood park improvements, respectively.

#### **5.21.5 Park and Open Space Characteristics**

The standards provided below ensure that all designated parks and/or open space are usable and have suitable size, location, dimension, topography, character, and access.

##### **5.21.5.1 Generally**

The required park or open space areas shall be provided as common areas for the use of all residents/occupants of the proposed development. Land designated as a park or open space shall be maintained as a park or open space and may not be separately sold, subdivided, or developed except as provided in § 5.21.5.2 Designation through 5.21.5.10 Access of this chapter.

##### **5.21.5.2 Designation**

Any areas reserved as a park or open space shall be indicated on the application for development approval. A parks and open space provision and maintenance plan shall be submitted as a part of the application for development approval, including the project phasing schedule. This plan shall designate and indicate the boundaries of all proposed parks or open space required by this section and the type of park or open space provided. Platted lots located within subdivisions and planned developments shall be located outside of the parks and open space areas. Parks and open space shall be placed in undivided preserves.

#### **5.21.5.3 School Site Locations**

Park sites shall be located, whenever possible, adjacent to and contiguous with school sites in order to make maximum use of common facilities and grounds. Land area dedicated to a school district shall be credited toward the minimum requirements of § 5.21.2 Required Parks/Open Space of this chapter if there is a joint use agreement between the [LOCAL GOVERNMENT] and the school district.

#### **5.21.5.4 Distance from Lots**

Parks and open space shall be not be further than ½ mile from any lot or, if the proposed development does not involve a subdivision or any principal building, this distance shall be measured from the entrance allowing people, bicycles, or equestrians to enter into the park or open space or to view the park or open space area. This distance shall be measured in a straight line, provided that the distance shall not be interrupted by an existing arterial street. The distance may be measured from a park or open space provided pursuant to this section or a public park or public open space area not provided by the applicant.

#### **5.21.5.5 Parks or Open Space in Floodplains or Water Features**

- (A) Areas within a floodplain shall not exceed 50 percent of the area counted as parks or open space, except as provided by subsection (B), below. Water features exceeding 2,500 square feet shall not be considered as parks or open space unless permitted by subsection (B), below.
- (B) The restriction on the maximum percentage of parks/open space in water features or floodplains (hereinafter “restricted areas”) can be increased to 75 percent where:
  - (1) An area of a minimum 25 feet in width surrounding a restricted area is improved as a greenway;
  - (2) The structures or activities located with the restricted areas do not cause an increase in base flood elevations;
  - (3) The velocities during a 10-year flood event do not exceed 6 feet per second; and
  - (4) For parks/open space dedicated to the [LOCAL GOVERNMENT], at least 1 acre is located outside of the restricted area.

#### **5.21.5.6 Percentage in Retention or Detention Areas**

- (A) Not more than 25 percent or 1 acre, whichever is less, of a retention area or detention basin required as part of the stormwater management standards (§ 5.22 Stormwater Management of this chapter) qualify as a park or open space area, subject to the requirements established in this section.
- (B) 50 percent or more of the active and usable area shall be above the 25-year storm level and designed for multiple uses.
- (C) Retention or detention areas used as park or open space shall be included as part of a greenbelt or a greenway. Retention or detention areas shall not be inundated in such a manner that they become unsuitable for their designated recreational purposes.
- (D) Retention or detention areas shall be constructed of natural materials. Terracing, berming, and contouring is required in order to naturalize and enhance the aesthetics of the basin.
- (E) Basin slopes shall not exceed a 3:1 slope.

#### **5.21.5.7 Walls and Fences**

Walls and fences, if used, shall not exceed 6 feet in height. This requirement does not apply to fences used in conjunction with athletic fields and tennis courts.

#### **5.21.5.8 Buffers or Landscaped Areas**

Any buffer or landscaped area provided pursuant to § 5.31 Buffers and Screening, § 5.34 Parking Lot Landscaping, and § 5.35 Entrance Landscaping of this chapter that meets the requirements of Table 5-10 for a particular category of parks or open space shall be credited toward the minimum parks and open space requirements of § 5.21.2 Required Parks/Open Space of this chapter.

#### **5.21.5.9 Slopes**

At least 50 percent of required dedicated park or open space land shall have slopes less than 7 percent.

#### **5.21.5.10 Access**

Parks and/or open space provided pursuant to this section shall have direct access to a public street or to a private street maintained by an HOA, condominium association, or apartment association.

<b>Table 5-10: Park/Open Space Categories</b>		
<i>(A) Park/Open Space Category</i>	<i>(B) Description</i>	<i>(C) Design/Maintenance Requirements</i>
Natural or agricultural areas		
Greenways		
Greenbelts		
Playgrounds		
Plazas		
Courtyard		
Forecourt		
Attached squares		
Detached square		
Green		
Park		
Parkway		
Community garden		

#### 5.21.6 Designation of Parks/Open Space

Areas designated as parks or open space shall not be subdivided but shall be shown as a “park” or “open space” on a plat. Land protected pursuant to this section that is intended to be used as a park shall be deeded as a park, regardless of ownership. In order to ensure that open space areas are maintained so that their use and enjoyment as parks and/or open space are not diminished or destroyed, parks and/or open space areas may be owned, preserved, and maintained by any mechanism or combination described in § 5.6 Operation and Maintenance of this chapter.

#### 5.21.7 Development Phasing

This section establishes a procedure for enforcing the requirements for parks and open space through development phasing while providing flexibility in the development approval process. This procedure recognizes that there is usually a delay between the date when a subdivision plat is approved and when lots are built upon and occupied, thus creating a demand for parks and open space.

- (A) In residential subdivisions that are to be platted in two or more phases, the required park or open space dedication must be provided in each phase of the subdivision except as provided in subsection (B), below.
- (B) If a subdivision is proposed in phases, the applicant may plat the first 100 lots pursuant to the preliminary plat and defer the provision of parks and/or open space to future phases of the development. No further subdivision plat

shall be approved unless and until parks or open space are provided in increments equal to the acreage required by § 5.21.2 Required Parks/Open Space of this chapter, subject to the phasing provisions of Table 5-11.

<b>Table 5-11: Development Phasing for Parks/Open Space</b>		
<i>Number of Lots Per Phase</i>	<i>Acres of Parks or Open Space Required</i>	<i>Timing of Improvements</i>
Phase 1: 1-100	Up to 1 (minimum size of 1 acre)	Phase 2
Phase 2: 101-300	Up to 2	Phase 3
Phase 3 through completion of development	As required by § 5.21.2 Required Parks/Open Space of this chapter	At time of platting

- (C) If any phase of the subdivision is platted without providing the required parks or open space at the time of platting and no future subdivision phases are planned pursuant to the preliminary plat, the parks or open space required shall be provided within one year after recordation of the plat and shall be secured by deferment contract as provided in subsection (D), below.
- (D) The [LOCAL GOVERNMENT] may authorize the developer to reserve parkland for dedication in subsequent phases of the subdivision by executing an enforceable contract with the [LOCAL GOVERNMENT]. The contract shall be approved as to form by the [LOCAL GOVERNMENT] attorney. In addition, the developer shall dedicate a reversionary public access easement on the final plat of the proposed development where necessary to provide effective public access, maintenance, and use of any parkland to be dedicated.

#### 5.21.8 Connectivity

The [LOCAL GOVERNMENT] finds and determines that an interconnected system of parks, trails, greenways, and bikeways provides a greater public benefit than isolated parks with access exclusively by automobiles. Such areas can provide form to neighborhoods, a common public gathering space, and an opportunity to protect natural areas. Accordingly, this section provides incentives for developers to link parks and open space provided pursuant to this section with other public or private park and open space areas. It is not the intent of this section to require developers or landowners to provide a general public benefit but rather to

create incentives for creativity in the design of parks and open space as well as creative opportunities to meet the requirements of this section.

- (A) Greenbelts, greenways, or linear parks provided pursuant to this subsection shall be credited toward the minimum park and open space area requirements of § 5.21.2 Required Parks/Open Space of this chapter at a ratio of 1 acre for every 20,000 square feet provided, where:
- (1) Such areas are aligned with a continuation of an area designated as a public greenway, linear park, or similar facility in a facilities plan officially adopted by the [LOCAL GOVERNMENT]; and
  - (2) Such areas include sidewalks, trails, or similar facilities that align with such facilities in an abutting tract or, where abutting tracts are unimproved, conform to the specifications set forth in the facilities plan.
- (B) Parks or open space provided pursuant to this subsection shall be credited toward the minimum park and open space area requirements at a ratio of 1 acre for every 20,000 square feet provided, where:
- (1) All lots within the proposed subdivision are within 1/4 mile of the park or open space; and
  - (2) The park or open space area abuts an area zoned "CN" (Commercial Neighborhood) or the area designated as a "center" in a TND.

### CONSERVATION SUBDIVISION

Conservation subdivisions are characterized by common open space, compact lots, less road pavement and, sometimes, clustered housing. The purpose of a conservation subdivision is to protect such resources as ridges and farmland while allowing the same housing density under zoning and subdivision regulations. A greater density, called a density bonus, may be offered to encourage conservation in residential development planning.

**Proposed Open Space Program:** The open space requirement element of the ordinance is to protect environmentally sensitive lands. It may also be used to provide recreation opportunities, including a density bonus with public access. The open space requirements are based on the underlying zoning classification and will generally range from 40 to 60 percent of the parcel. The required open space

is required to be protected from development through a conservation easement.

The open space land should be determined by several factors; some are primary, others are secondary. Primary conservation areas should be included as open spaces because of environmental values and sensitivity to development, including slopes in excess of 25 percent and the floodplains along stream corridors. Secondary Conservation Areas are features that should be protected but are not as high a priority, such as forested 15 to 25 percent slopes and farmland.

**Density Determination:** Residential density will not be less than that allowed under conventional residential zone districts (such as the city's and county's low density residential zoning) or through the rezoning provisions of planned residential zoning. Essentially, the minimum lot size of the zone district is divided into the parcel size to determine the density that would be permitted without conservation provisions. Some cities and counties ask for a preliminary plan (sometimes referred to as a "yield plan"), showing the residential lot layout to determine the number of lots that could be created under convention zoning and subdivision codes. Thereafter, the designer can use the flexibility of the conservation subdivision provisions, including reduced lot size and narrower streets, to create a layout that set asides the open spaces and allows consideration of density bonuses.

**Density Bonus Provisions:** As noted in the zoning policy section (page \_\_\_\_), density may be increased in relation to the conservation of hillside and ridgetops. The proposed density bonus is up to a 10 percent increase in dwelling units when a conservation easement is placed on the open space, and an additional density bonus of 10 percent when public access is provided to the conserved open space. Additional density bonuses may be considered by the planning commission when other resources are conserved, such as stream corridors or farmland.

**Open Space Management:** The management and permanent protection of the open space is required to protect the resource from destruction or unscrupulous development. Restrictive mechanisms, including deed restrictions, conservation easements and transfer of ownership to a conservation organization, are the typical approaches. The management of the open space should be handled by the entity that has

ownership, such as a neighborhood organization, conservation organization or park department.

**Applicable Zoning Districts:** The conservation subdivision option should be available within most residential zoning districts. The recommended hillside zoning districts and the county's agricultural zoning district are the best suited to protect hillside and ridge resources; a density bonus should be considered in both these zones to foster conservation. Pre-existing zoning, such as the Low Density Residential (RA) District, should also be considered when a developer desires to save a resource such as a hillside by reducing lot size and potentially clustered housing.

#### **A Model Conservation Subdivision Ordinance**

The following draft is the basis for a conservation subdivision ordinance that should be considered by Knox County interests. A similar ordinance can be prepared for the City of Knoxville.

### **Conservation Subdivision Ordinance**

#### **SECTION 1.1 PURPOSE**

This regulation has been created to realize the following purposes:

- A. To provide flexibility in design in agricultural and residential zoning districts to promote environmental resource conservation and efficient uses of the land.
- B. To preserve in perpetuity unique or sensitive natural, historic and archaeological resources such as forested areas, steep slopes, ridgetops, prime farmlands, floodplains, wetlands, stream corridors, wildlife habitats, and places recognized on local, state and national registers of historic places.
- C. To permit clustering of houses and structures on less environmentally sensitive areas.
- D. To reduce the amount of infrastructure, including paved surfaces and utility easements, necessary for residential development.
- E. To reduce erosion and sedimentation by minimizing land disturbance and removal of vegetation during residential development.
- F. To promote interconnected open spaces throughout the community, particularly for wildlife and habitat protection.
- G. To encourage street designs that reduce traffic

speed and the amount of pavement.

- H. To promote construction of convenient walking trails and bike paths both within the subdivision and connected to neighboring communities, businesses and community facilities to reduce reliance on automobiles, especially to provide subdivision residents the means to reach parks and schools.

### **SECTION 1.2 GENERAL REGULATIONS**

#### **A. Applicability of Regulations.**

The Conservation Subdivision option is available for zoning districts classified as Agricultural and Low Density Residential, including planned residential districts. Applicants shall comply with all other provisions of the zoning code and all other applicable laws, except those that are incompatible with the provisions contained herein.

#### **B. Ownership of Development Site.**

The tract of land to be subdivided may be held in single and separate ownership or in multiple ownership. If held in multiple ownership, however, the site shall be developed according to a single plan with common authority and common responsibility.

#### **C. Housing Density Determination.**

The allowable number of units in a Conservation Subdivision shall be determined using the Net Density Calculation or the Yield Plan method. Density bonuses may be allowed up to 20% over the Allowed Units per Acre. Qualifying bonuses are outlined in Section 1.2.C.3.

##### **1. Net Density Calculation:**

- This calculation can only be used for zoning districts where a specified units per acre has been determined (for example, Planned Development zoning districts). Density is determined by multiplying the net acres on the site by the approved number of units per acre (plus the applicable density bonus). The net acres of a site is the total acres (gross acres) minus the acreage of the following:
- a. Floodways,
  - b. Bodies of water over 5000 square feet of contiguous area,
  - c. Wetlands that meet the definition of the Army Corps of Engineers pursuant to the Clean Water Act,
  - d. The areas of slope over 50 percent,
  - e. Cemeteries and burial grounds.

##### **2. Yield Plan:**

This method determines how many

detached, single-dwelling unit lots could be developed on a site using zoning and subdivision standards required for the site under a conventional development scenario. The number of lots in this plan will determine the density in the conservation subdivision before any density bonuses are applied.

*The Yield Plan must be prepared as a conceptual layout plan in accordance with the standards of the Minimum Subdivision Regulations, containing proposed lots, streets, right-of-way, and other pertinent features. Although it must be drawn to scale, it need not be based on a field survey. However, it must be a realistic layout reflecting a development pattern that could reasonably be expected to be implemented, taking into account the presence of wetlands, floodplains, steep slopes, existing easements or encumbrances and, if unsewered, the suitability of soils for subsurface sewage disposal.*

3. Density Bonus Provision:

Density bonuses are awarded when a development plan incorporates one or more of the following:

- a. 50% or more of the required open space is protected in perpetuity by a legal instrument pursuant to Section 1.4.G.1.a of the Conservation Subdivision Ordinance -- 10% bonus;
- b. Land that is dedicated for public purposes. The decision whether to accept an applicant's offer to dedicate lands for public usage within a proposed subdivision shall be at the discretion of the County, or with a conservation organization (such as a parks foundation) acceptable by the County to hold the land in perpetuity for public use. The density bonus will be determined by the Planning Commission, based on park needs determined through adopted plans for the area -- up to a 10% bonus ;
- c. The dedicated open space is 60% in all zones other than Agricultural, in which case 70% is required and a 10% bonus may be provided as determined by the planning

commission, taking into account the size of the conserved farm land.

**D. Road Width and Design Provisions.**

In order to reduce the impact of stormwater runoff, conserve natural features of the site and reduce monetary and energy costs associated with road development and maintenance, the following road design standards may be used in creating conservation subdivisions:

1. Road pavement width (and on-street parking, Average Daily Traffic/ADT) requirements:
  - a. 20 feet (no parking, <350 ADT)
  - b. 20 to 22 feet (no parking, 350 to 1000ADT)
  - c. 22 to 26 feet (parking on one side, <350ADT)
  - d. 26 feet (parking on both sides, <350 ADT)
  - e. 26 feet (one side, 350 to 1000 ADT);
2. Rather than curb and gutter, grass-lined roadside swales may be used to handle storm water runoff when appropriate and approved by the County Engineering Department;
3. Roads shall not traverse slopes greater than a 25 percent slope. If the applicant can demonstrate a hardship created by this requirement, the Planning Commission may approve such crossings.
4. An ADA compliant sidewalk or walking path system shall be provided along streets within the subdivision. Linkages of the pedestrian system shall be made to pedestrian systems adjacent to the subdivision. Sidewalks shall be constructed of concrete, or asphalt (if separated from road pavement by four or more feet). Walking trails may be constructed of asphalt, crusher run or other approved material.

**E. Lot Width and Depth, Setbacks and Size Requirements.**

1. The following two development approval options are available for properties with zoning that does not require development plan review. Properties with zoning that requires development plan review will use the same approval process as required by the zoning district:
  - a. The zoning district lot size and setback and lot coverage requirement can be modified as shown in Table 1, however, lot sizes must be approved by the Health Department when using septic systems. Common areas may be considered outside the lots for wastewater systems.

Table 1			
Zoning Classification	Lot Size	Setbacks	Lot Coverage
	Reduce Minimum Requirement by:		Increase Maximum to:
Agricultural	60%	50%	45%
Low Density Residential	30%	30%	45%

- b. A development plan can be created using the same development approval requirements as the Planned Development zoning districts where the dimensional standards will be determined as part of the development plan approved by the Planning Commission, County Board of Zoning Appeals and any other regulating authority (for example, Health Department).
  2. All new dwellings shall meet the following building setback requirements:
    - a. From all external roads ROW: 100 feet
    - b. From all other tract boundaries: 75 feet
    - c. From all cropland or pasture land: 100 feet
  3. All new lots that are on private septic/sewer must be approved by the Knox County Health Department. Off site septic systems are acceptable in Conservation Subdivisions with the appropriate agencies.
- F. Height:**  
As required by the applicable zoning district.
- G. Tree Protection Areas.**  
Areas designated for tree protection that are located outside of the dedicated open space shall be identified on the site plan. These areas shall include the critical root zone and greatest extent of the dripline for the trees included in the area to be protected.
- H. Off-Street Parking:**  
As required by the applicable zoning district. Credits may be approved for on-street parking, subject to approval by the Planning Commission.

### SECTION 1.3 APPLICATION REQUIREMENTS

- A. Concept Plan.** In addition to the requirements of a Concept Plan (roads, lots, drainage, etc) in the Minimum Subdivision Regulations, the following information is required:
  1. Site Analysis Map.  
The purpose of this map is to ensure that

the important site features have been adequately identified prior to the creation of the concept plan, and that the proposed open space will meet the requirements of this article. The site analysis map shall include the following features:

- a. Property boundaries;
    - b. All streams, rivers, lakes, wetlands, flood plains, sinkholes and other hydrologic features;
    - c. Topographic contours of no less than 4-foot intervals
    - d. Hillside and ridgetop protection district boundary;
    - e. General vegetation characteristics (forested areas, grasslands, etc);
    - f. Primary and locally important farmland soils;
    - g. Soils prone to slippage;
    - h. Existing roads and structures;
    - i. Potential connections with existing or proposed public greenways, parks and facilities;
    - j. Wildlife habitats;
    - k. Scenic views.
  2. Conservation Areas Map.  
All Primary and Secondary Conservation Areas labeled by type, as described in Section 1.4 of this Article;
  3. Open Space Map. The planned location of protected open space as required in Section 1.4.B.
- B. Design Plan.**  
In addition to the engineering design, construction drawing and related requirements of a Design Plan in the Minimum Subdivision Regulations, the following information is required:
    1. The designated open space.
    2. Tree protection area(s) located outside a dedicated open space.
  - C. Final Plat.**  
In addition to the requirements of a Final Plat in the Subdivision Regulations, the following information is required:
    1. All areas designated as open space (lots and/or easements) must be labeled as open space.
    2. Plan for Management of Open Space and Operation of Common Facilities.  
An open space management plan, as described in Section 1.4.F, shall be prepared and submitted.

3. Instrument of Permanent Protection.  
An instrument of permanent protection, such as a conservation easement or permanent restrictive covenant as described in Section 1.4, shall be placed on the open space and recorded prior to final plat certification for recording.

**D. Other Requirements.**

The Applicant shall adhere to all applicable requirements of the underlying zoning and the subdivision regulations that are not in conflict with the Conservation Subdivision regulations.

**SECTION 1.4 OPEN SPACE**

**A. Definition.**

Open space is the portion of the conservation subdivision that has been set aside for permanent protection. Activities within the open space are restricted in perpetuity through the use of an approved legal instrument. Yards shall not be counted as open space.

**B. Open Space Requirement.** The required open space may be more than the minimum if the acreage of Primary Conservation Areas is more than the minimum required.

- a. Low Density Residential Zones –  
The minimum restricted open space shall comprise at least 40% of the gross tract area when public sewer and water is provided.
- b. Agricultural Zones –  
The minimum restricted open space shall comprise at least 60% of the gross tract area.

**C. Standards to Determine Open Space.**

1. Primary Conservation Areas - The following are required to be included within the open space, unless the applicant demonstrates that this provision would constitute an unusual hardship and be counter to the purposes of this article:
  - a. The 100-year floodplain;
  - b. Riparian zones of at least 75 foot width from the bank of all waterbodies regulated by the applicable stormwater ordinance of the County;
  - c. Slopes above 25 percent of at least a 20,000 square foot contiguous area;
  - d. Wetlands that meet the definition used by the Army Corps of Engineers pursuant to the Clean Water Act;
  - e. Known populations of endangered or

threatened species, or habitat for such species;

- f. Archaeological sites and Native American burial grounds.

**2. Secondary Conservation Areas -**  
The following should be included within the open space to the maximum extent feasible:

- a. Historic sites on the local, state or national registers;
- b. Existing healthy, native forests of at least one acre of contiguous area;
- c. Individual existing healthy trees greater than 8 inches caliper, as measured from four and half (4.5) feet above the ground;
- d. Other significant natural features and scenic viewsheds such as ridge lines, peaks and rock outcroppings, particularly those that can be seen from public roads or places;
- e. Existing trails that connect the tract to neighboring areas;
- f. Prime and locally important farmland soils;
- g. Slopes 15 percent or more of at least 1 acre in contiguous area;
- h. Areas within a designated hillside and ridgetop area;
- i. Wildlife habitats;
- j. Sinkholes.

3. Above-ground utility rights-of-way and small areas of impervious surface may be included within the protected open space, but cannot be counted towards the 40% minimum area requirement (with the exception of historic structures and existing trails, which may be counted). Large areas of impervious surface shall be excluded from the open space.
4. The Planning Commission may require that at least 10% of the open space consist of land that is suitable for active recreation space such as playfields.
5. The open space should adjoin any neighboring areas of open space, other protected areas, and non-protected natural areas that would be candidates for inclusion as part of a future area of protected open space, such as adjacent steep slopes or prime farmlands.
6. The open space shall be directly accessible

to the largest practicable number of lots within the subdivision. Non-adjoining lots shall be provided with safe, convenient access to the open space, such as a walking trail. Such access shall be provided outside of a driving lane.

**D. Permitted Uses of Open Space.**

1. Uses of open space may include the following:
  - a. Conservation of natural, archeological or historical resources; or similar conservation-oriented areas;
  - b. Walking or bicycle trails;
  - c. Passive recreation areas, such as open fields;
  - d. Active recreation areas, provided that they are limited to no more than 10% of the required open space and are not located within Primary Conservation Areas. Active recreation areas may include impervious surfaces. Active recreation areas in excess of this limit must be located outside of the protected open space.
  - e. Agriculture, horticulture, silviculture or pasture uses, provided that all applicable stormwater best management practices are used to minimize environmental impacts, and such activities are not conducted within Primary Conservation Areas;
  - f. Landscaped stormwater management facilities, community wastewater disposal systems and individual wastewater disposal systems located on soils particularly suited to such uses. Such facilities shall be located outside of Primary Conservation Areas;
  - g. Easements for drainage, access, and underground utility lines;
  - h. Wetlands and/or bioretention areas created as part of stormwater quality improvements with an operations and maintenance plan recorded with the deed as required by the applicable stormwater ordinance of the County;
  - i. Other conservation-oriented uses that the Planning Commission determines to be compatible with the purposes of this ordinance.

**E. Prohibited Uses of Open Space.**

1. Golf course acreage;

2. Roads, parking lots and impervious surfaces, except as specifically authorized in the previous sections;
3. Impoundments such as retention and detention basins (does not include wetlands and bioretention areas as outlined in Section 1.4 D.1.h);

**F. Ownership and Management of Open Space.**  
**Ownership**

1. All required open space shall be permanently restricted from future subdivision and development. Under no circumstances shall any development be permitted in the open space at any time, except for those uses listed in Section 1.4D.
2. Ownership of open space may be one or more of the following:
  - a. Fee Simple Dedication to the County: The County may, but shall not be required to, accept a portion of the common facilities, provided that:
    - i. There is no cost of acquisition to the County; and,
    - ii. The County agrees to and has access to maintain such facilities.
  - b. Condominium Association: Common facilities may be controlled through the use of condominium agreements. Such agreements shall be in accordance with relevant state law. All open land and common facilities shall be held as "common elements."
  - c. Homeowner Association: Common facilities may be held in common ownership by a homeowner association subject to all of the following being met:
    - i. Membership in the association shall be automatic (mandatory) for all purchases of dwelling units therein and their successors in title.
    - ii. The association shall be responsible for maintenance and insurance of common facilities.
    - iii. The bylaws shall confer legal authority on the association to place a lien on the real property of any member who falls delinquent in dues. Such shall be paid with the accrued interest before the lien may be lifted.

- iv. Written notice of any proposed transfer of common facilities by the association or the assumption of maintenance for common facilities must be given to all members of the association and to the County no less than thirty (30) days prior to such event.
- d. Private Conservation Organization: An owner may transfer either fee simple title of the open space or easements of the open space to a private non-profit conservation organization provided that:
  - i. The conservation organization is acceptable to the County and is a bona fide conservation organization intended to exist indefinitely;
  - ii. The conveyance contains appropriate provisions for proper reverter or retransfer in the event that the organization becomes unwilling or unable to continue carrying out its functions;
  - iii. The open space is permanently restricted from future development through a conservation easement and the County is given the ability to enforce these restrictions; and
  - iv. A maintenance agreement acceptable to the County is established between the owner and the organization.
- e. Dedication of Easements to the Local Government: The County may, but shall not be required to, accept easements for public use of any portion of the common land or facilities. In such cases, the facility remains in the ownership of the condominium association, homeowner association, or private conservation organization while the easements are held by the County. In addition, the following regulations shall apply:
  - i. There shall be no cost of acquisition to the County.
  - ii. Any such easements for public use shall be accessible to the residents of the County.

- iii. A satisfactory maintenance agreement shall be reached between the owner and the municipality.

#### **Management**

1. Unless otherwise agreed to by the County, the cost and responsibility of maintaining common facilities and open space shall be borne by the property owner, condominium association, homeowner association, or conservation organization.
2. The applicant shall submit and the Planning Commission shall approve a Plan for Management of Open Space and Operation of Common Facilities ("Plan") in accordance with the following requirements:
  - a. The plan shall define ownership;
  - b. The plan shall establish necessary regular and periodic operation and maintenance responsibilities for the various kinds of open space (for example: lawns, playing fields, woodlands, pastures, croplands, meadows, etc.);
  - c. The plan shall estimate staffing needs, insurance requirements, and associated costs and define the means for funding the maintenance of the open space and operation of any common facilities on an ongoing basis. In addition, the plan shall include the means for funding long-term capital improvements as well as regular yearly operating and maintenance costs;
  - d. At the County's discretion, the applicant may be required to escrow sufficient funds for the maintenance and operation costs of common facilities for up to one year; and
  - e. Any changes to the management plan shall be approved by the County, and in the case of areas dedicated to a local government by County Commission, following a recommendation of County Park Board, or its successor.
3. In the event that the organization established to maintain the open space and the common facilities, or any successor organization thereto, fails to maintain all or any portion thereof in reasonable order and condition, the County may assume

responsibility for maintenance and may enter the premises and take corrective action, including extended maintenance. The costs of such corrective action may be charged to the property owner, condominium association, homeowner association, conservation organization, or individual property owners who make up a condominium or homeowner association and may include administrative costs and penalties. Such costs shall become a lien on said properties.

**G. Legal Instrument for Permanent Protection.**

1. The open space shall be protected in perpetuity by a binding legal instrument that is recorded with the deed. The instrument shall be one of the following:
  - a. A permanent conservation easement pursuant to section 170(h) of the Internal Revenue Code, as amended, in favor of either:
    - i. A land trust or similar conservation-oriented non-profit organization with legal authority to accept such easements. The organization shall be bona fide and in perpetual existence and the conveyance instruments shall contain an appropriate provision for retransfer in the event the organization becomes unable to carry out its functions; or
    - ii. A governmental entity with an interest in pursuing goals compatible with the purposes of this ordinance.
  - b. A permanent restrictive covenant for conservation purposes in favor of a governmental entity.
  - c. An equivalent legal tool that provides permanent protection, if approved by the County.
2. The instrument for permanent protection shall include clear restrictions on the use of the open space. These restrictions shall include all restrictions contained in this article, as well as any further restrictions the applicant chooses to place on the use of the open space.

**DEFINITIONS**

The definitions of the Knox County Zoning Ordinance and Knoxville – Knox County, Tennessee Minimum Subdivision Regulations shall apply, with the following additions.

**Conservation Easement:** A nonpossessory interest of a holder in real property imposing limitations or affirmative obligations on the owner of the servient estate, the owner's heirs, and assigns with respect to the use and management of the servient land, structures or features thereon, and/or activities conducted thereon, which limitations and affirmative obligations are intended to preserve, maintain or enhance the present condition, use or natural beauty of the land, the open-space value, the air or water quality, the agricultural, forest, recreational, geological, biological, historic, architectural, archeological, cultural or scenic resources of the servient estate and is recorded in the register's office of the county in which the easement is located.

**Conservation Areas, Primary:** Lands upon which primary resources are located in conservation subdivisions. All Primary Conservation Areas are required to be located within the Open Space.

**Conservation Areas, Secondary:** Lands containing secondary resources that are conserved as part of the Open Space.

**Critical Root Zone:** The minimum area beneath a tree that must be left undisturbed in order to reserve a sufficient root mass to give a tree a reasonable chance of survival. The critical root zone is typically represented by a concentric circle centering on the tree trunk with a radius equal in feet to one and a half (1.5) times the number of inches of the trunk diameter at four and a half (4.5) feet above the ground: (CRZ in ft = 1.5 x D in.).

**Holder:** *a.* A public body empowered to hold and interest in real property under the laws of the state or the United States; or *b.* a charitable corporation, charitable association, or charitable trust, the purposes or powers of which include retaining or protecting the natural, scenic, or open-space values of real property, assuring the availability of real property for agricultural, forest, recreational, or open-space use, protecting natural resources, maintaining or enhancing air or water quality, or preserving the historical, architectural, archeological, or cultural aspects of real property.

**Open Space:** A parcel or parcels of land and/or water, within a conservation subdivision, set aside for the protection of natural and cultural resources. Greenway land consists of Primary and Secondary Conservation Areas and is permanently restricted against further development.

**Tree Protection Area:** Areas where trees, or strands of trees, are to be preserved and protected during project development.

## URBAN AGRICULTURE

Text from: [www.foodsecurity.org](http://www.foodsecurity.org)

The text that follows is from *Urban Agriculture and Community Food Security in the United States: Farming from the City Center to the Urban Fringe*, a primer prepared by the Community Food Security Coalition's North American Urban Agriculture Committee, 2003.

### What is Urban Agriculture?

As of 2002, the population of the United States is 280,540,330 people. In less than 50 years, the U.S. Census Bureau projects that immigration will cause the population to increase from its present 280 million to more than 400 million. The foreign-born population is currently 33.1 million, equal to 11.5 percent of the U.S. population. Of this total, the Census Bureau estimates 8 to 9 million are illegal immigrants.

Approximately 80% of the population lives in metropolitan areas. In its broadest sense, and with the exception of the Midwest, all agriculture is now considered to be urban or urban-influenced, meaning that it occurs in or near urban metropolitan counties. Urban agriculture defined in simple terms is the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities.

A definition which takes into account the use of resources is defined by the United Nations Development Programme as "an industry that produces, processes and markets food and fuel, largely in response to the daily demand of consumers within a town, city, or metropolis, on land and water dispersed throughout the urban and peri-urban area, applying intensive production methods, using and reusing natural resources and urban wastes, to yield a diversity of crops and livestock." Further, the Council on Agriculture, Science and Technology (CAST) takes into account all aspects of agriculture, its associated businesses, natural resources, and

its influences on humans in this definition: "Urban agriculture is a complex system encompassing a spectrum of interests, from a traditional core of activities associated with the production, processing, marketing, distribution, and consumption, to a multiplicity of other benefits and services that are less widely acknowledged and documented. These include recreation and leisure; economic vitality and business entrepreneurship, individual health and well-being; community health and well-being; landscape beautification; and environmental restoration and remediation." Because the North American Urban Agriculture Committee is a committee within the Community Food Security Coalition,<sup>13</sup> its primary purpose is to utilize urban agriculture as a means for the food insecure to gain access to fresh affordable, nutritious food. Thus, the simplest definition of urban agriculture is the one used when defining the programs of the committee, though many times its programs and its partnerships with other organizations are inclusive of the concerns addressed in the more complex definitions. Additionally, the focus of this primer is on the agriculture that occurs within city limits and less on the agriculture outside the city, except as it relates to the regional food system.

Sustainable urban agriculture is an essential tool that addresses a city's problems in innovative ways. Environmental stewardship is enhanced through urban agriculture's efforts to green cities. Purchasing food that is locally grown decreases energy needs and costs associated with long distance travel and refrigeration. Economic development and community revitalization are achieved when neighborhoods take pride in a community garden, when inner-city residents gain the ability to grow and market their own food, and when inner-city farmers' markets provide new opportunities for entrepreneurs and commercial farmers. Individual health and a sense of empowerment is enhanced when urban dwellers have access to and greater control over their own food system. The city's residents can benefit from cleaner air, lower summer temperatures and recycled waste water and trash. Urban farming takes into account the real cost of food and the real benefits from a local and regional food system.

### Food Insecurity in U.S. Towns and Cities

Food security is all persons in a community having access to culturally acceptable, nutritionally adequate food through local, non-emergency sources at all times.

As mentioned earlier, in the United States, 80 percent of the population lives in cities. This is in marked contrast to 100 years ago when 50 percent of Americans lived on farms or in small rural communities where they fed themselves with locally grown foods. More food is shipped from markets outside the U.S. than at anytime in history.

As the urban population has grown, so too has the complexity of how to feed people who are so far removed from the actual production of foods. The sheer tonnage of food that must be transported daily to supply a city's residents is stunning. Food products typically travel between 1,500 and 2,500 miles from farm to plate, as much as 25 percent farther than food products traveled in 1980.<sup>15</sup> Fruits and vegetables shipped from distant states and countries can spend as many as seven to fourteen days in transit before arriving in the supermarket. Almost 50% of the food transported is lost to spoilage. Most fruit and vegetable varieties sold in supermarkets are chosen for their ability to withstand industrial harvesting equipment and extended travel, not for their taste or nutritional quality.

While many enjoy the advantages of an array of foods, there are significant social, economic, public health, and environmental costs to the food system. The environmental costs of large-scale, industrial agriculture include air pollution, surface and groundwater contamination, soil erosion, and the loss of bio-diversity. Contract farmers have less control over the inputs onto the farm, and the quality and type of produce sold from the farm. Rural communities have been destabilized and rural food security decreased as the economic benefits in these communities more often travels outside of rather than remains within the community.

One of the worst paradoxes in human history and one of the consequences of the economic structure of the current food system is hunger in the midst of plenty. An unacceptable number of Americans, including many children, do not get enough to eat on a daily basis. The percentage of people in poverty rose to 12.4 percent in 2002, up from 12.1 percent in 2001. Thirty-three million people - including 13 million children - live in households that experience hunger or the risk of hunger.<sup>16</sup> Food insecurity in the U.S. is represented by people who frequently skip meals or eat too little, sometimes going without food for a whole day. They tend to have lower quality diets or must resort to seeking emergency food because they cannot afford the food they need. In 2002, the U.S. Census Bureau

released a report stating that more than 1.3 million Americans are living below the official poverty line. An increasing number of working Americans, known as the working poor, are experiencing food insecurity in greater numbers. Those needing emergency food in Massachusetts asked emergency food providers to remain open later in the day so that they could stop by and pick-up food on their way home from work.<sup>17</sup> A 25-city survey by the U.S. Conference of Mayors reported that requests for emergency food assistance increased an average of 19 percent as housing costs continued to rise faster than incomes and the national economy remained weak.

Even when cash is available to low-income urban residents, food is not always accessible. Many supermarkets have closed or moved from the inner-city due to complex market forces related to the increasing impoverishment of their clientele and the deterioration and depopulation of once vibrant communities. Because many inner city residents do not own cars, transportation to suburban food stores is often difficult, requiring several bus changes or expensive taxi services. If one has small children, is disabled or elderly, food shopping can become a great hardship. The quality and quantity of food are lacking in small neighborhood stores. A study of all food stores in three low-income zip codes in Detroit found that only 19 percent, or fewer than one in five stores, carried a minimal "healthy food basket" (products based on the food pyramid). Merchants tend to leave perishable food on the shelf longer, compromising quality and safety, further limiting customers' choices for nutritious and affordable meals. Many inner-city grocery and convenience stores charge higher prices for even basic food items. People on limited incomes in cities are likely to pay more for their food than wealthier shoppers in higher income neighborhoods.

Food insecurity, whether related to actual food insufficiency, nutritional quality, or anxiety about a future lack of food, affects the quality of life of urban residents in far reaching ways. Inadequate nutrition is clearly associated with school and work absences, fatigue, and problems with concentration. Hunger and poor nutrition are linked to the increased incidence and virulence of infectious diseases, many of which - such as tuberculosis - are on the rise. Preschool and school aged children who experience chronic hunger have higher levels of anxiety, depression, and behavior problems than children with no hunger. Furthermore, the lack of a nutritious diet is a well-known risk factor for diabetes, hypertension, and heart failure.

## Appendix C:

# Funding Sources for Bicycle and Pedestrian Facilities

There are numerous funding sources for bicycle and pedestrian infrastructure planning and projects. The *2009 Regional Bicycle and Pedestrian Study* completed by the Nashville Area Metropolitan Planning Organization compiled a list of funding sources, which is reprinted below, with their permission.

For more information on these programs, refer to Technical Memorandum #7 of the study: Funding Toolbox ([http://www.nashvillempo.org/docs/bikeped/Tech\\_Memo\\_7\\_final\\_113009.pdf](http://www.nashvillempo.org/docs/bikeped/Tech_Memo_7_final_113009.pdf)).

Funding Source	Category	Relevant Project Type(s)
Interstate Maintenance (IM) Funds	Federal	Facilities (Interchanges/Overpasses)
National Highway System (NHS) Funds	Federal	Facilities (National Highway System only)
Surface Transportation Program (STP) Funds	Federal	Facilities, Programs, ADA Projects
Transportation Enhancement (TE) Grant Funds	Federal	Facilities, Educational Activities, Rail-Trails
Congestion Mitigation and Air Quality Improvement Program (CMAQ) Funds	Federal	Facilities, Safety Projects
High Priority Projects (HPP) Program Funds	Federal	Facilities
Highway Bridge Program (HBP) Funds	Federal	Facilities (Across Bridges)
Recreational Trails Program Grant Funds	Federal	Trail Facilities
Transportation, Community, and System Preservation (TCSP) Program Grant Funds	Federal	Planning and Facilities
National Scenic Byways Program Grant (NSBP) Funds	Federal	Planning, Facilities, and Programs
Federal Lands Highway Program Grant (FLHP) Funds	Federal	Facilities (e.g. trails) near/inside Federal lands
Safe Routes to School Program (SRTS) Grant Funds	Federal	Facilities, Education, & Enforcement (School-Based)
Highway Safety Improvement Program (HSIP) Funds	Federal	Safety-Related Programs and Projects
State and Community Highway Safety Grant Funds	Federal	Safety-Related Programs and Projects
State Planning & Research (SPR) Funds	Federal	Planning and Research
Metropolitan Planning (PL) Funds	Federal	Planning and Programs
Federal Transit Program Funds	Federal	Access to Transit
Job Access and Reverse Commute (JARC) Grant Funds	Federal	Bicycle-Related Services
Land and Water Conservation Fund (LWCF) Grants	Federal	Trail and Greenway Facilities
EPA Climate Showcase Communities Grants	Federal	Climate Change Initiatives
HUD Community Development Block Grant (CDBG) Funds	Federal	Facilities
Tennessee Tax-Based Funding Sources	State/Local	Facilities
Hotel-Motel Tax	Local	Facilities
Local Parks and Recreation Fund (LPRF) Grants	State	Greenway/Trail Projects
Natural Resources Trust Fund (NRTF) Grants	State	Greenway/Trail Projects
Private Sector Requirements	Local	Facilities
Bikes Belong Coalition Grants	Private	Trail Projects
National Civilian Community Corps Grants	Private	Trail Projects
Kodak American Greenways Awards	Private	Greenways
Fish America Foundation Grants	Private	Greenways
American Hiking Society National Trails Fund Grants	Private	Hiking Trails
Global ReLeaf Program Grants	Private	Trail Tree Plantings
Robert Wood Johnson Foundation Grants	Private	Physical Activity-Related, Environments, or Policies

## Appendix D:

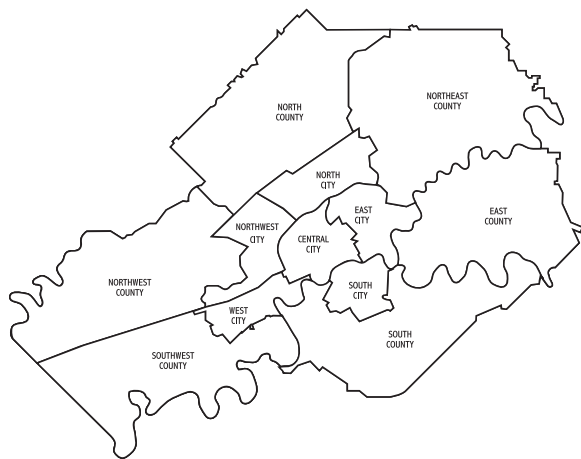
# Model Community Analysis

### THE INSKIP, LONSDALE, AND MASCOT COMMUNITIES

The first portion of these Appendices has described methods of analysis for improving access to healthy foods and places for active living, as well as best practices and funding sources for increasing active transportation and healthy eating.

This Appendix will describe the initial three target neighborhoods for the Knox County Healthy Kids, Healthy Communities program, using these analysis tools, and make recommendations for improving access to healthy choices in those neighborhoods.

Some of the analysis takes place on the sector level. As part of the long-range planning process, the City of Knoxville and Knox County are divided into planning sectors. Inskip is located in the North City Sector, Lonsdale is in the Central City Sector, and Mascot is in the Northeast County Sector.



### INSKIP COMMUNITY

Inskip is a suburban community located in Knoxville's North City Sector. Nearly 95 percent of the children attending Inskip's public elementary school are considered economically disadvantaged (TN Department of Education), and an estimated 45.7 percent of elementary-aged children in this

community are either overweight or obese. The Inskip area contains a mixture of modest and well-maintained early-1920s homes, public housing and low-income apartment complexes, and light industrial and warehouse property. There are few sidewalks, and they offer limited connectivity where they do exist.

Multiple convenience stores, with large selections of low-nutrient foods, can be found near Inskip's elementary school. There is also a large grocery store in the community – although heavy motor vehicle traffic and lack of active transportation opportunities limit pedestrian or bicycle access to the store.

### LONSDALE COMMUNITY

The Lonsdale community is a low-income neighborhood located in Knoxville's Central City Sector. The median household income for the census tract that contains Lonsdale is \$23,560, compared with \$46,233 for Knox County as a whole (U.S. Census Bureau American Community Survey 2005-2009 5-year estimate). According to the Tennessee Department of Education, approximately 95 percent of the 250 children who attend Lonsdale Elementary School are considered economically disadvantaged. Body Mass Index (BMI) surveillance from 2008 indicate that an estimated 51.8 percent of elementary-aged children in this community are either overweight or obese. The Lonsdale community faces multiple challenges, including numerous vacant lots, blighting influences, and dilapidated buildings.

Several convenience stores are located in Lonsdale, offering mostly foods of low nutritional value and few, if any, fruits, vegetables, whole grains or low-fat dairy selections. A major grocery store recently opened within two miles of the community, however transportation by foot or bicycle is hindered by an incomplete bicycle and pedestrian transportation network combined with significant truck traffic in the area. Bus

transportation runs every 30 minutes from 6 a.m. to 6 p.m. during the week, and on a more limited schedule on weekends.

Lonsdale has many assets as well. It is located within Knoxville's Empowerment Zone and has been targeted for redevelopment and renewal. There is an elementary school and a recreation center in Lonsdale. A community farm, staffed by AmeriCorps volunteers, has been established in an adjoining neighborhood. The City has established a neighborhood committee to improve healthy recreation opportunities in Lonsdale.

### MASCOT COMMUNITY

Mascot is located in rural East Knox County, approximately 14 miles from downtown Knoxville. The community is made up of low-density residential areas and mobile home parks, agricultural land and some industrial businesses. When asked to describe Mascot, a community member stated, "The elementary school is the community."

The Tennessee Department of Education characterizes 71.5 percent of the children who attend East Knox County Elementary School as economically disadvantaged. An estimated 53.4 percent of elementary-aged children in Mascot are either overweight or obese. Many of the residential roads in rural East Knox County lack shoulders and are lined with open storm water culverts on one or both sides, presenting a hazard to pedestrians and bicycle riders. Recreation opportunity exists at a small state park adjacent to the community, and at a small community park near the elementary school.

Retail food options are limited to three convenience stores in Mascot, and the nearest large grocery store is approximately five miles from the community. However, the farming heritage in this area presents potential opportunity for both farmers and consumers.

### NEIGHBORHOOD CONNECTIVITY

The tables that follow are the link-node ratios for the three study areas and, for comparison, the Fort Sanders neighborhood adjacent to downtown and the University of Tennessee. The higher the link-node ratio, the greater the connectivity of a neighborhood street network.

The first table compares the connectivity of the neighborhoods based on both internal and external nodes and links.

Table 1: Internal and External Link-Node Ratios			
Study Area	Links	Nodes	Ratio
Fort Sanders	179	114	1.57
Inskip	244	198	1.23
Lonsdale	220	162	1.36
Mascot	172	140	1.23

*Note: All links and nodes in the study areas included*

The second table compares connectivity based on internal links and nodes only.

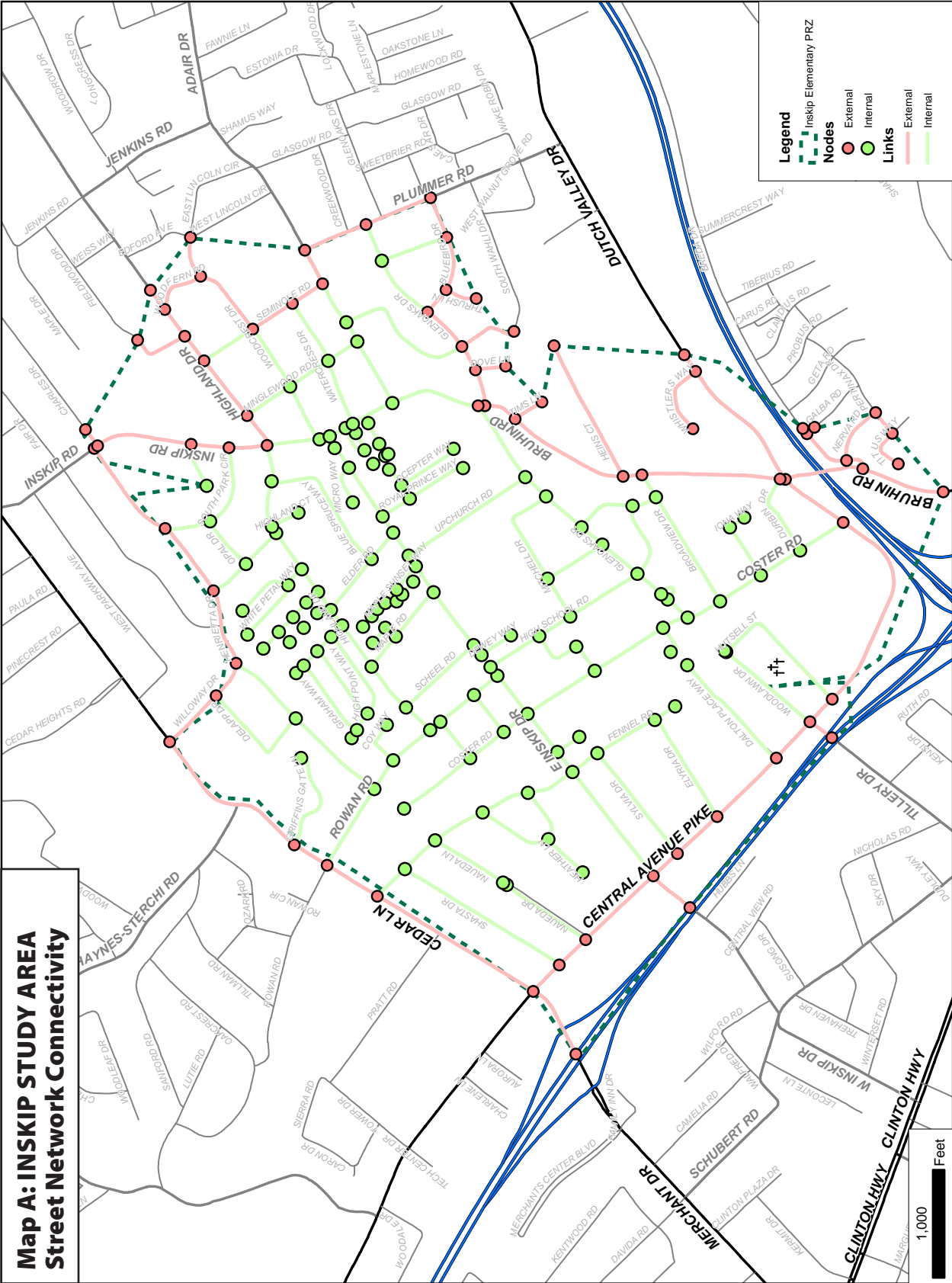
Table 2: Internal Link-Node Ratios			
Study Area	Links	Nodes	Ratio
Fort Sanders	141	82	1.72
Inskip	174	128	1.35
Lonsdale	210	146	1.44
Mascot	105	80	1.31

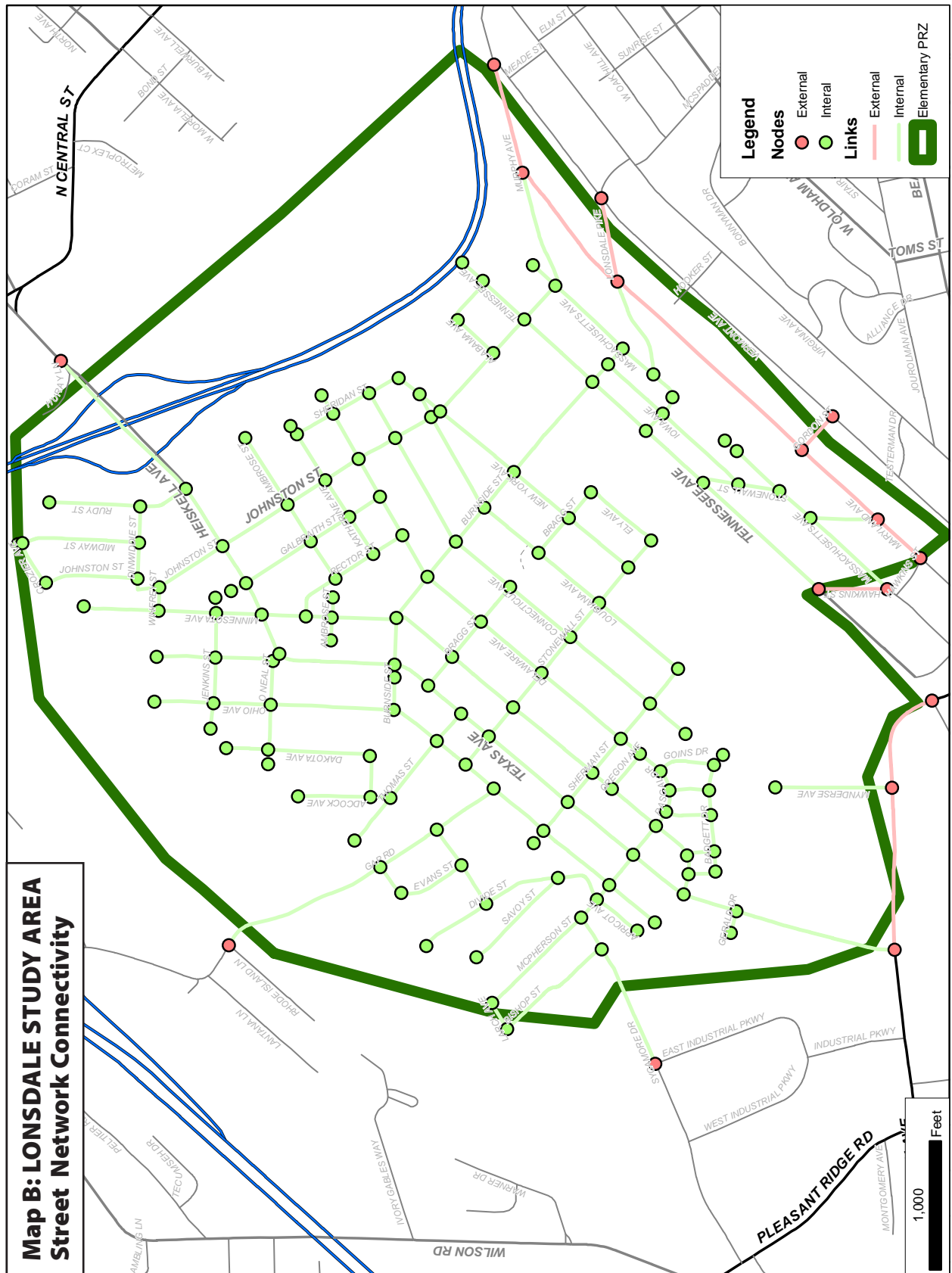
*Note: Only internal links and nodes included*

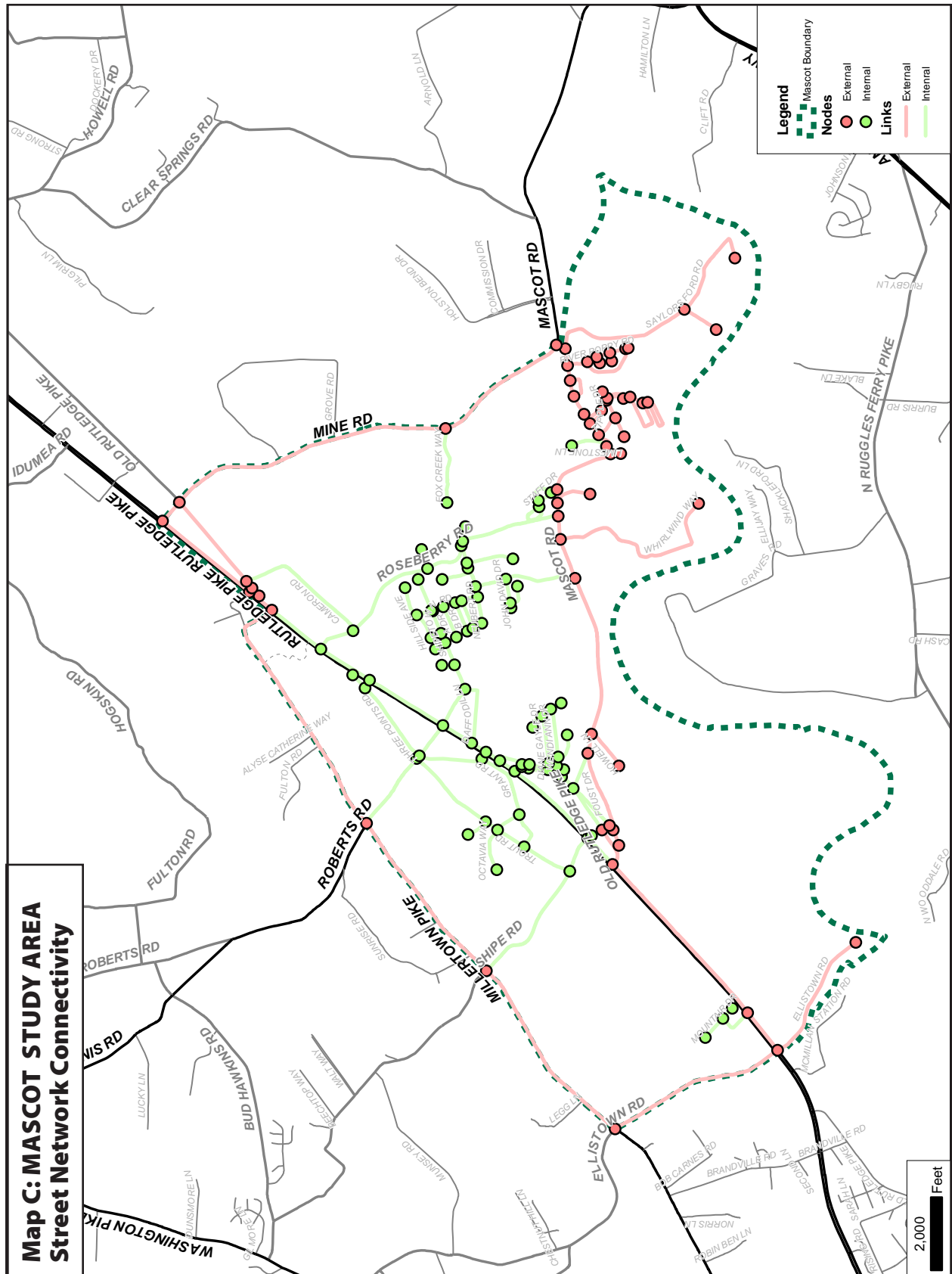
This demonstrates the differences in the link-node ratio when entrance nodes are included or excluded in the calculation.

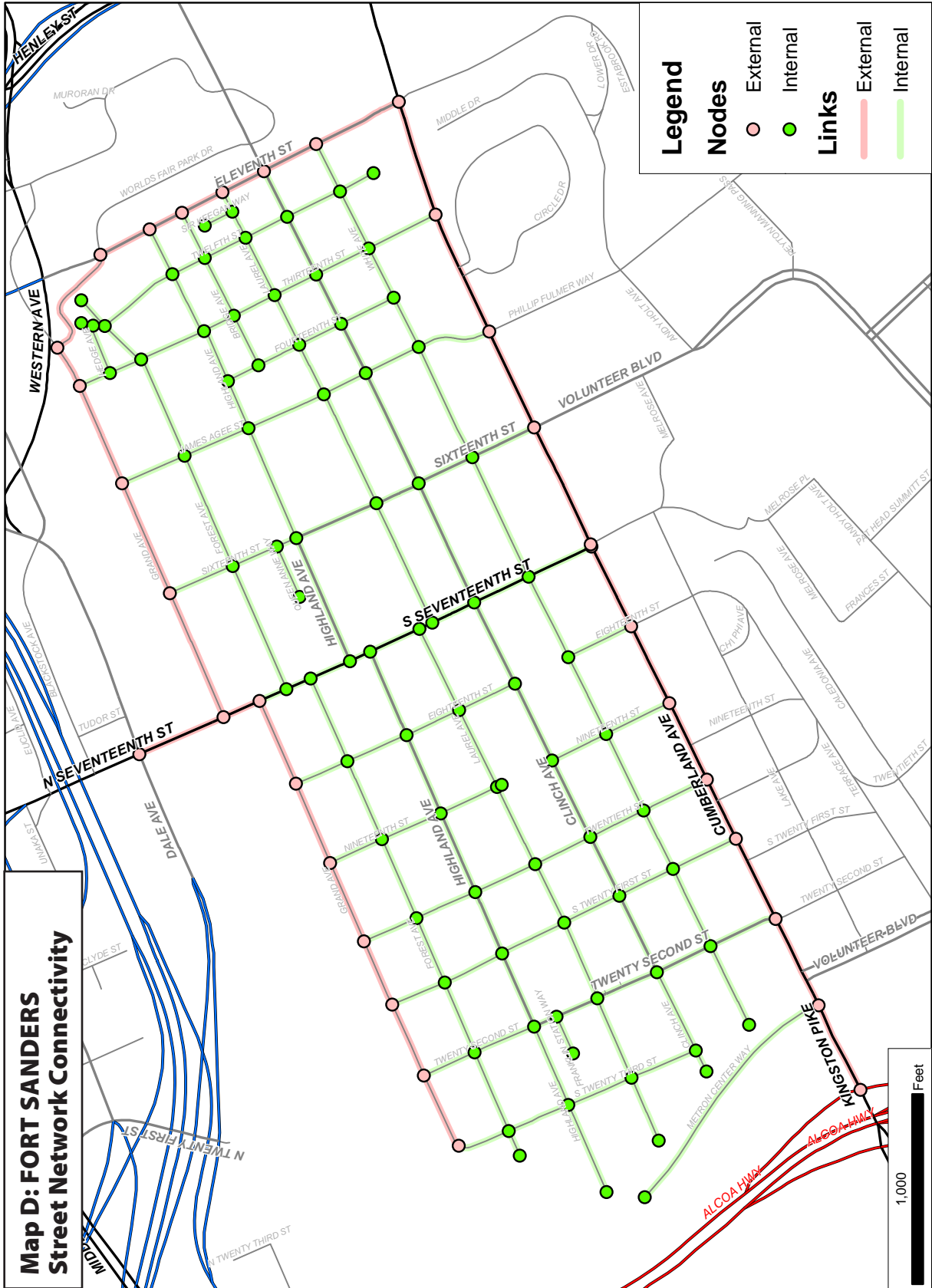
In defining the study areas' boundaries, the road network was cut off at some locations along the boundary, which created some artificial external nodes and consequently lowered the link-node ratio. These artificial nodes and links were included in the calculations for the first table, and excluded from the second table.

Each of the study areas of Inskip, Lonsdale and Mascot would see improvements in walkability, bicycle-friendliness and overall accessibility by increasing street connectivity.

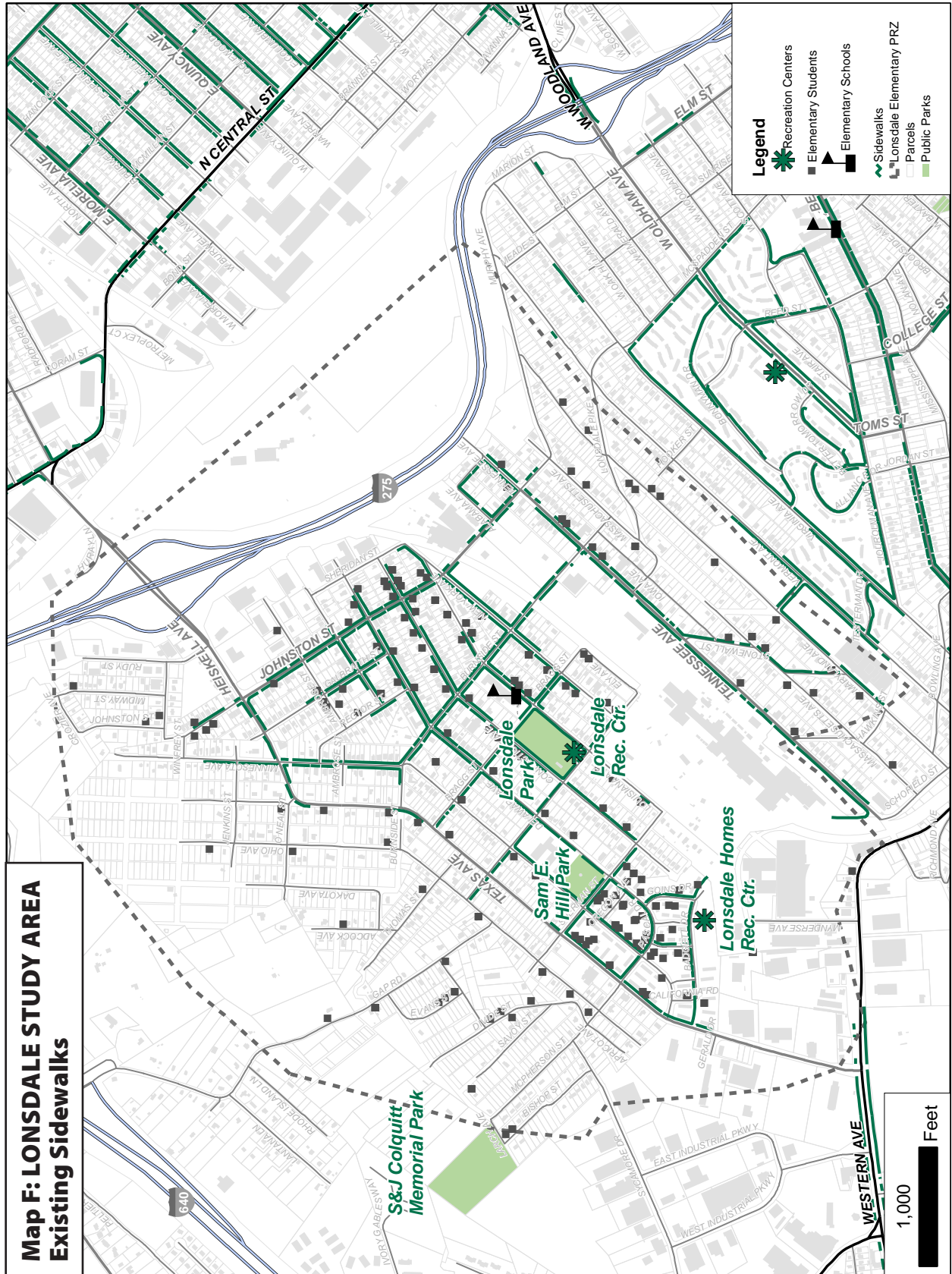


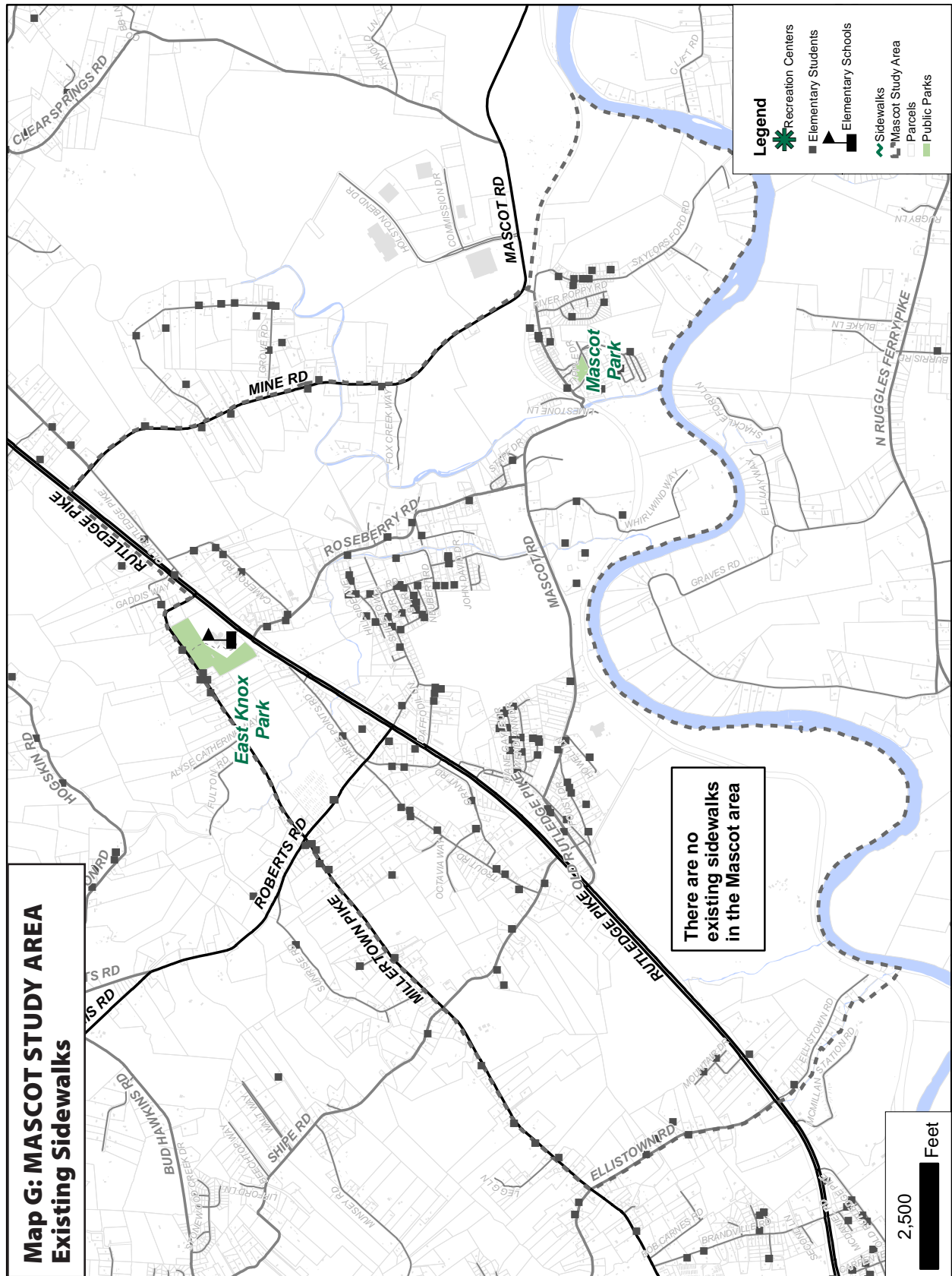












## FOOD ACCESS

Food options are quite scarce in the Lonsdale and Mascot study areas. The two grocery stores found in these areas are quite small and may have limited food selections. The Breeze Thru mart in Lonsdale has a drive-up window and the Town and Country Market in Mascot also serves as a gas station.

Restaurant options are non-existent. The Inskip area has more food sources than the other two locations, but most are limited to the northwest corner of the area along Merchant Drive/Cedar Lane. A full-sized Ingles supermarket is located on the north side of this major road as well.

County-wide, access to food sources varies quite dramatically, as shown in Table 3. The West City Sector features the greatest number of per capita food sources in five of the six categories. The Central City Sector also has a higher number of per capita food sources than most other sectors. The Northeast County Sector, home to Mascot, is the most food-deficient sector in the county, with the North and Northwest County sectors trailing.

Cedar Bluff Intermediate School has the highest number of fast food restaurants in its parental responsibility zone (PRZ) of any other elementary/intermediate school PRZ in the county. Farragut Intermediate and Bearden Elementary each have five fast food restaurants in their PRZs, but also offer more than twice that number in full-service restaurants.

The Northeast County has the highest ratio of fast food other restaurants (other than those that serve only drinks, desserts or specialized foods). More than half of the sector's restaurant options are fast food. Next is the South City Sector and the North County Sector. Conversely, the Central City, West City and Southwest County sectors have the lowest ratio of fast food restaurants.

## Community Gardens

Three maps on the following pages show potential community garden locations that are derived from datasets that are stored in the Knoxville, Knox County, KUB Geographic Information System (KGIS) database, which is the centralized repository for nearly all Knox County geographic datasets. The Existing Land Use layer maintained by MPC links the Knox County Property Assessor's land use codes to the KGIS parcel map layer and then reclassifies these detailed use classes into broader groupings. It identifies parcels that are vacant or used for

agriculture or forestry uses, which does include parcels with a single family residence on 10 or more acres. This map layer also lists public and quasi-public land used for institutional purposes that may be partially used for community gardens. These include churches, civic clubs, and government-owned properties such as schools, libraries, public housing and property owned by Knoxville's Community Development Corporation (KCDC). The Points of Interest map layer, maintained by KGIS, also identifies many of these locations and can be used to pinpoint public or quasi-public land that is owned by churches.

MPC is currently working with the City of Knoxville's Community Development Department to identify vacant and potentially blighted properties. This committee has defined "nuisance" properties as parcels that are classified as vacant in the MPC Existing Land Use map layer; and have three or more dirty lot violations since 2003; and are tax delinquent for up to 2 years.

They define "potentially blighted lots" as parcels that meet the same criteria as nuisance lots, but are tax delinquent for three or more years. This committee has also identified city and county tax sale parcels that remain unsold. Some of these tax sale properties may be occupied by structures, but these parcels can be cross referenced with the existing land use layer to identify those without structures.

KGIS also maintains a list of publicly owned properties that can be readily linked to the parcel map. Many of these properties overlap with properties identified in the above geographic datasets, but the remaining properties are shown in the maps as "Other Publicly Owned Land (KGIS)." Finally, the KGIS database includes major power transmission lines under which community garden could be developed in the utility easement.

Table 3: Food Sources by MPC Planning Sector								
Sector	2006 Population Estimate	Grocery • Supermarkets	Convenience Stores	Beer • Wine • Liquor Stores	Restaurants	Secondary Food Retailers	Markets	Total
CITY								
Central	51,283	19	30	7	169	9	10	244
East	27,645	10	16	4	37	8	1	76
North	27,434	5	18	5	68	6	2	104
Northwest	30,077	6	18	4	70	10	1	109
South	19,873	6	12	2	31	5	3	59
West	21,970	11	20	6	158	12	10	217
COUNTY								
East	14,446	4	15	1	28	2	1	51
North	46,009	4	22	3	69	8	2	108
Northeast	23,594	6	12		15	2		35
Northwest	67,691	10	30	4	83	10	2	139
South	20,873	3	10	3	22	3	1	42
Southwest	61,071	11	32	9	187	15	5	259
TOTAL	411,966	95	235	48	937	90	38	1443

Table 4: Per Capita Food Sources by MPC Planning Sector								
Sector	2006 Population Estimate	Grocery • Supermarkets	Convenience Stores	Beer • Wine • Liquor Stores	Restaurants	Secondary Food Retailers <sup>1</sup>	Markets <sup>2</sup>	Total
CITY								
Central	51,283	0.370	0.585	0.136	3.295	0.175	0.195	4.757
East	27,645	0.362	0.579	0.145	1.338	0.289	0.036	2.749
North	27,434	0.182	0.656	0.182	2.479	0.219	0.073	3.790
Northwest	30,077	0.199	0.598	0.133	2.327	0.332	0.033	3.624
South	19,873	0.302	0.604	0.101	1.560	0.252	0.151	2.968
West	21,970	0.501	0.910	0.273	7.192	0.546	0.455	9.877
COUNTY								
East	14,446	0.277	1.038	0.069	1.938	0.138	0.069	3.530
North	46,009	0.087	0.478	0.065	1.500	0.174	0.043	2.347
Northeast	23,594	0.254	0.509	0.000	0.636	0.085	0.000	1.483
Northwest	67,691	0.148	0.443	0.059	1.226	0.148	0.030	2.053
South	20,873	0.144	0.479	0.144	1.054	0.144	0.048	2.012
Southwest	61,071	0.180	0.524	0.147	3.062	0.246	0.082	4.240

<sup>1</sup> Markets includes meat, seafood, fruit and vegetable and bakeries

<sup>2</sup> Secondary Food Retailers include department stores, discount department stores, and pharmacies and drug stores which retail food products  
Sources: Metropolitan Planning Commission, 2008; InfoUSA Establishment Data, 2/1/2007

Table 5: Summary of Food Establishments by Elementary School Parental Responsibility Zones									
School	Deli	Full Service	Sandwich Subs	Fast Food	Take Out Delivery	Coffee Tea	Ice Cream Yogurt Smoothies	Cookies Doughnuts Pretzels	Total
Ball Camp Primary	0	0	1	0	0	0	0	0	1
Bearden Elementary	5	35	2	5	1	1	3	1	53
Belle Morris Elementary	0	4	0	4	0	0	0	0	8
Brickey Elementary	0	3	0	0	0	0	1	0	4
Cedar Bluff Intermediate	0	7	1	7	2	1	2	1	21
Chilhowee Intermediate	1	1	0	0	0	0	0	0	2
Christenberry Elementary	3	5	2	4	0	0	0	0	14
Dogwood Elementary	2	2	1	2	0	0	0	0	7
Farragut Intermediate	1	11	1	5	3	1	0	1	23
Farragut Primary	1	11	0	1	1	1	0	1	16
Fountain City Elementary	3	3	1	2	1	0	1	0	11
Gibbs Elementary	0	1	1	0	1	0	2	0	5
Green Magnet Elementary*	4	33	2	3	0	5	2	0	49
Halls Elementary	0	7	1	2	1	0	0	0	11
Inskip Elementary	0	8	0	1	0	1	0	0	10
Karns Intermediate	0	4	1	2	0	0	0	0	7
Maynard Elementary	0	1	0	0	0	0	0	0	1
Norwood Elementary	1	7	0	4	0	0	1	0	13
Pleasant Ridge Elementary	1	0	0	0	1	0	0	0	2
Pond Gap Elementary	0	3	1	0	0	0	0	0	4
Powell Elementary	0	4	1	1	1	0	0	0	7
Rocky Hill Elementary	0	5	1	1	1	0	2	0	10
Sequoyah Elementary	0	1	0	0	0	1	0	0	2
South Knoxville Elementary	0	2	0	3	0	0	0	0	5
Spring Hill Elementary	0	0	0	1	0	0	0	0	1
Sunnyview Primary	0	1	0	0	0	0	0	0	1
West Haven Elementary	0	3	0	5	0	0	0	0	8
West Hills Elementary	2	9	2	4	2	2	2	3	26
WEST VIEW ELEMENTARY	0	1	0	0	0	0	0	0	1

\*Green Magnet School PRZ includes Downtown and The Old City

Deli: (Keyword - Deli, Bagels) includes grocery store delis, Panera Bread

Full Service: includes cafeterias

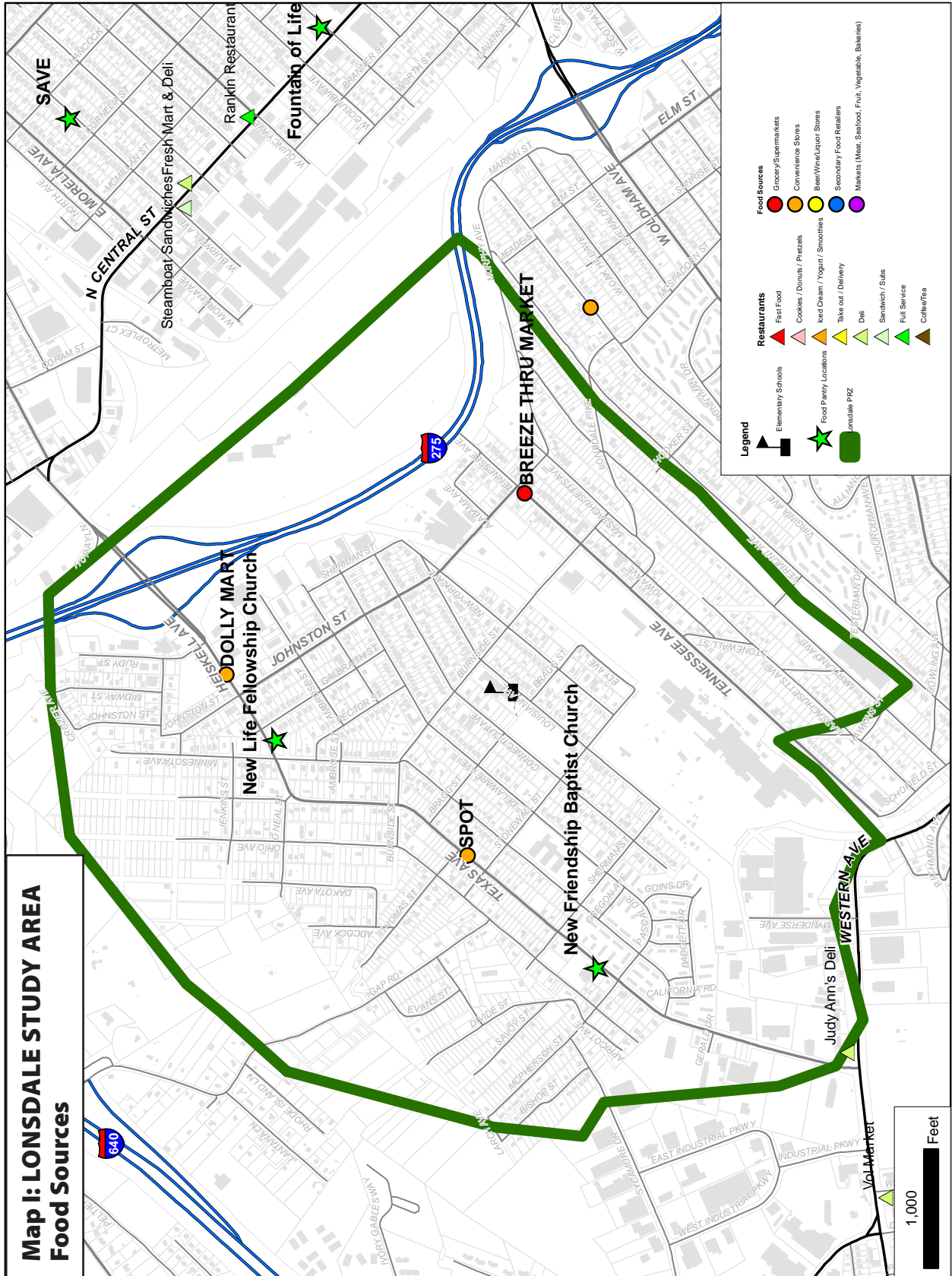
Sandwich/Subs: (Keyword - Sub, Sandwich, not deli, not pizza) includes Subway, Blimpie, Lennys, Firehouse, Quiznos, grocery store deli

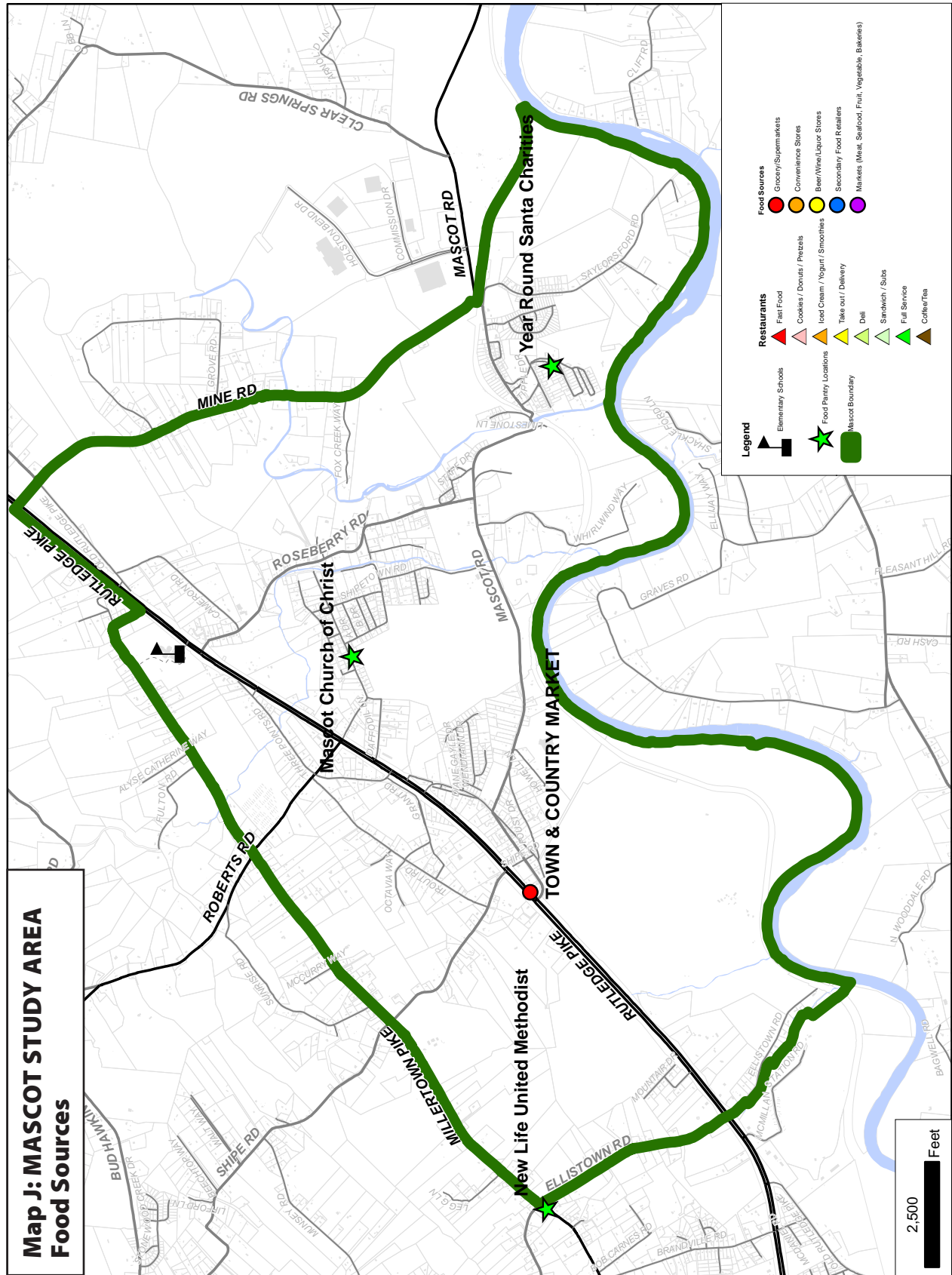
Fast Food: National Chains such as McDonald's, Burger King, Captain D's

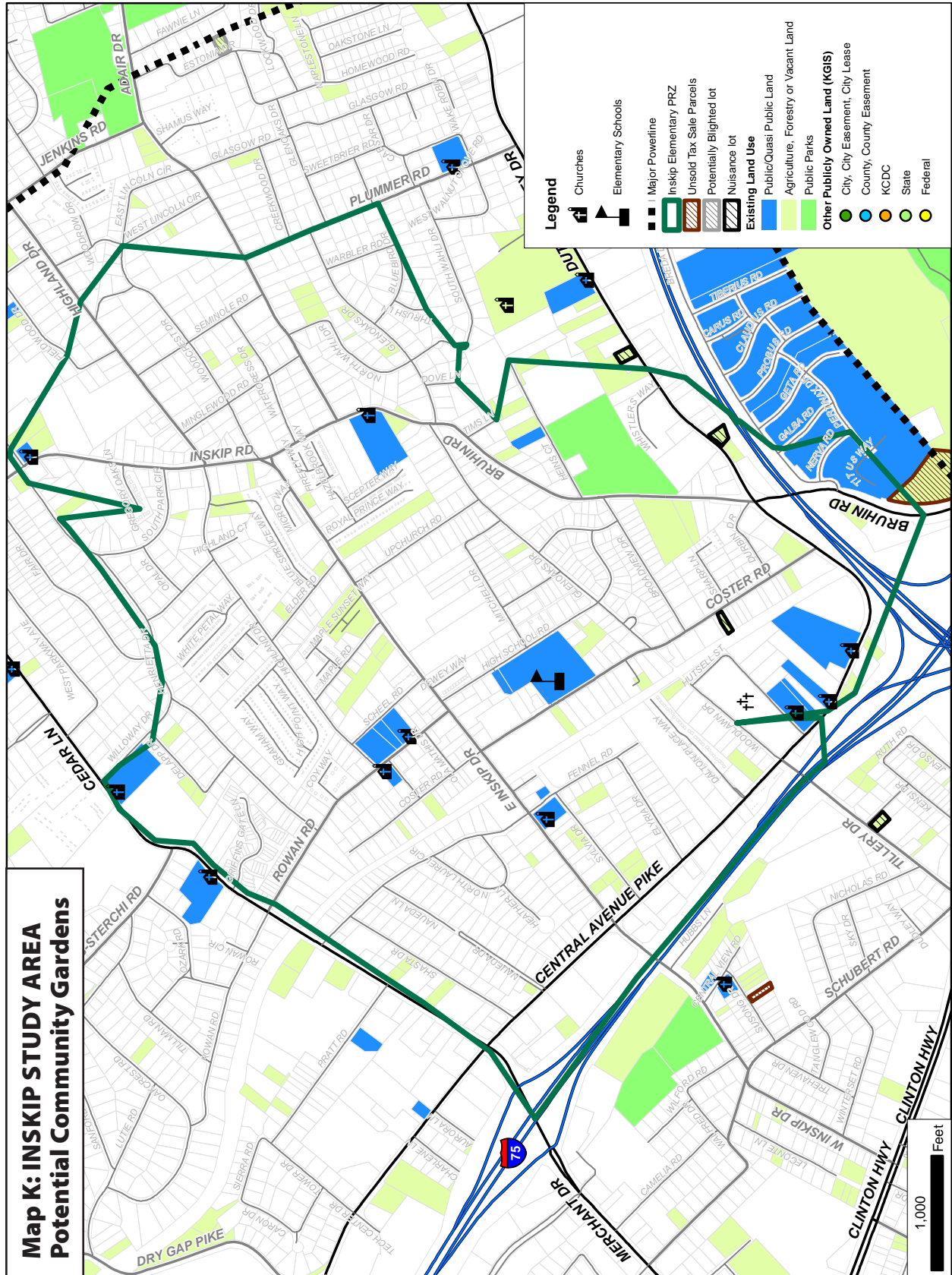
Coffee/Tea: (Keyword - Coffee, Tea) exludes Pete's Coffee Shop

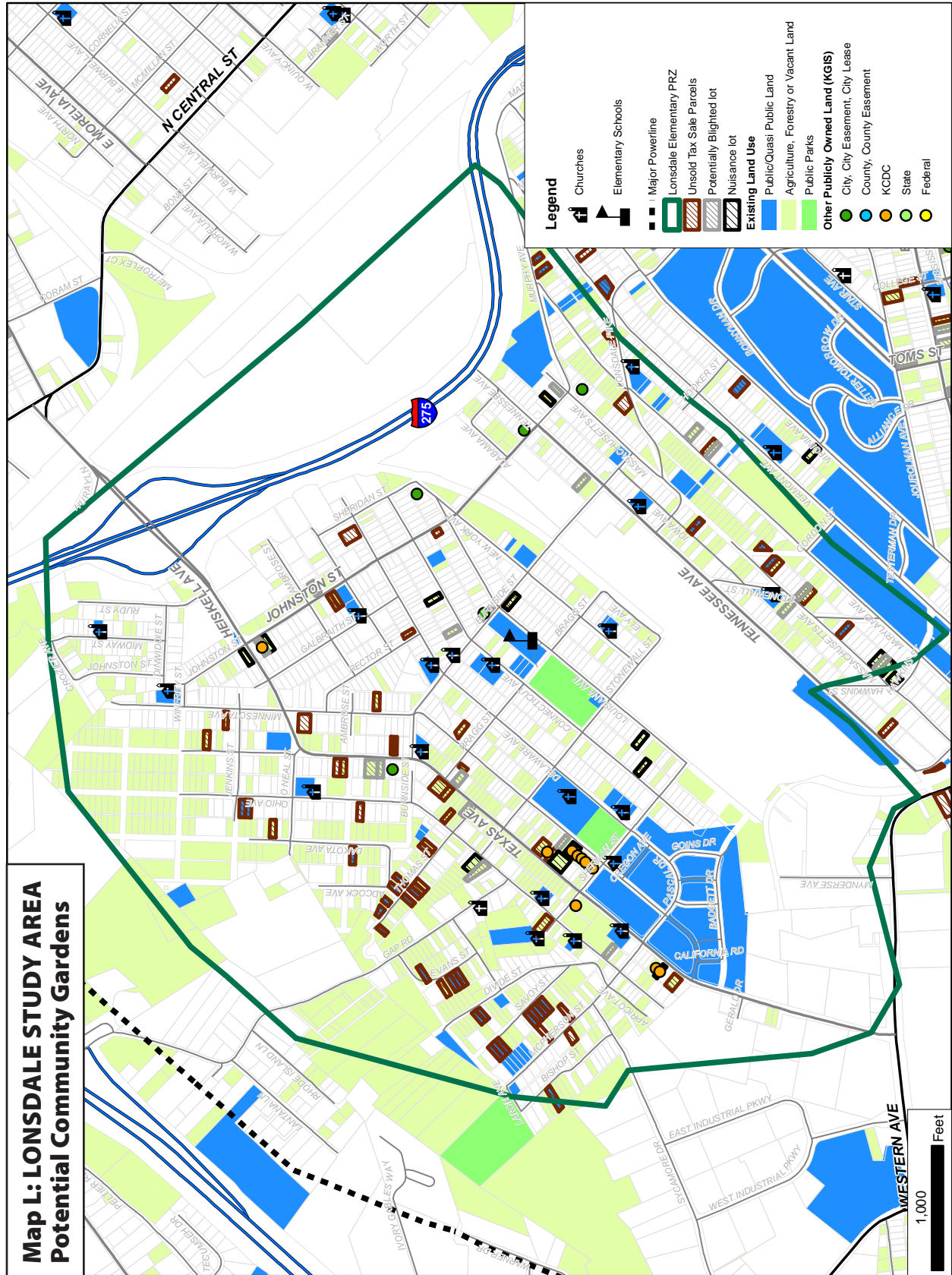
Cookies/Doughnuts/Pretzels: (Keyword - Cookie, Doughnut, Pretzel)













## ACCESSIBILITY TO RECREATION

Recreation is an essential component for active living. The 2009 *Knoxville-Knox County Park, Recreation and Greenways Plan* provides a basis of analysis for existing facilities and long-range planning for recreation in the communities of Lonsdale, Inskip and Mascot.

Proximity and connectivity to recreational facilities are nearly as important as the facilities themselves. Close-to-home parks are parks that are within a short walking or driving distance to most residents. The Central City, North City and Northeast County sectors represent some of the lowest acreages of close-to-home parks in the city and county. In urban areas a park or greenway should be within a one-quarter mile walk of residents; in lower density suburban areas the walking distance should be one-half mile. The National Park and Recreation Association (NRPA) recommends guidelines for park services based on acreage per 1,000 citizens. The NRPA standard for close-to-home parks, which includes neighborhood and community parks, and parks on school grounds, is a range of 6.25-10.5 acres of parks for every 1,000 residents. The standard of 6.25 acres per thousand residents is what both the city and county parks departments have used as a baseline standard for the last several years. All three communities, Inskip, Lonsdale, and Mascot, are below the NRPA standard.

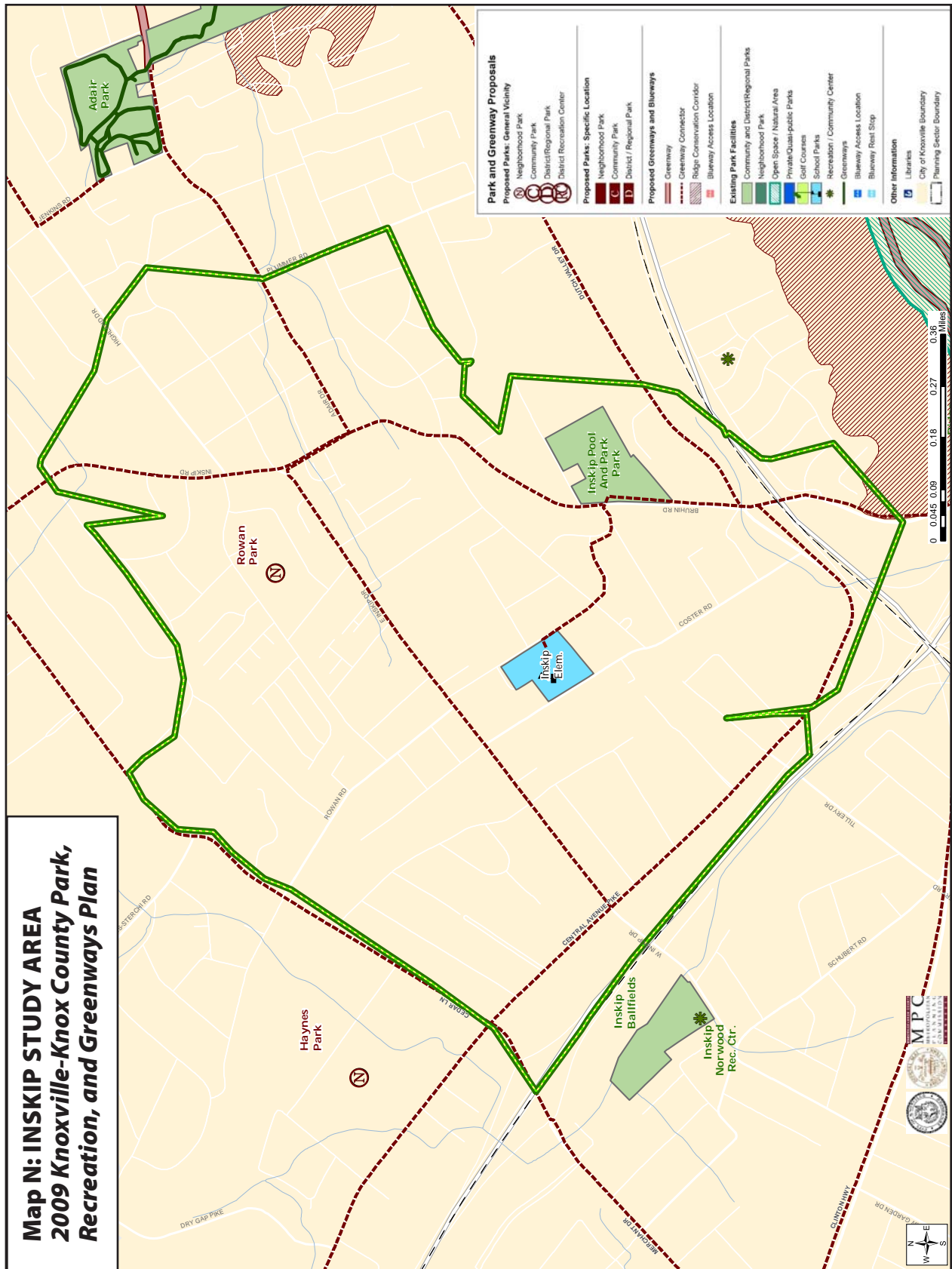
Table 6: Close-to-Home Parks in Study Area	
MPC Planning Sector	Acres of park land per 1,000 residents
<b>Central City</b> (includes Lonsdale)	4.93
<b>North City</b> (includes Inskip)	5.07
<b>Northeast County</b> (includes Mascot)	3.35

A diversity of recreation opportunities is critical to maintaining active lifestyles. An analysis of existing recreation facilities for sectors demonstrates several deficits in the communities of Inskip, Lonsdale, and Mascot. Surplus and deficit status is based on NRPA standards for population sizes within service areas of one-quarter to one-half mile for activities such as baseball, basketball, softball, volleyball and tennis. For recreation types that require larger areas such as football, soccer and swimming, NRPA service areas extend to larger population sizes or within 1-2 miles or drive times of 15 to 30 minutes.

Table 7: National Park and Recreation Association (NRPA) Guidelines	
<b>Baseball</b>	1 field per 6,000 residents, with a service radius of 1/4 to 1/2 mile, suggested minimum size 1.2 A (little league) 3.0 Official
<b>Basketball</b>	1 court per 5,000 residents, with a service radius of 1/4 to 1/2 mile, range from 2400-7980 sq. ft.
<b>Football</b>	1 field per 20,000 residents, with travel time of 15-30 minutes, range from 160' x 360' plus 6' clearance or 1.5 AC minimum
<b>Soccer</b>	1 field per 4,000 residents, within 1-2 miles of most population, range from 1.7-2.1 acres
<b>Softball</b>	1 field per 6,000 residents, with a service radius of 1/4 to 1/2 mile
<b>Swimming Pool</b>	1 pool per 25,000 population, 15-30 minute drive, 0.5-2 acres in size
<b>Tennis Court</b>	1 court per 4,000 population, 1/4-1/2 mile, minimum of 7,200 sq. ft. in size
<b>Volleyball</b>	1 court per 5,000 population, 1/2-1 mile, minimum of 4,000 sq. ft. in size

Table 8. Surplus or Deficit of Recreation Facility Type Meeting NRPA Guidelines			
Recreation Facility Type	Central City (includes Lonsdale)	North City (includes Inskip)	Northeast County (includes Mascot)
Baseball	0	0	+3
Basketball	+18	+2	-2
Football	+3	-1	-1
Soccer	-11	-4	-5
Softball	-3	-5	-2
Swimming Pool	-2	-1	-1
Tennis Court	+14	+10	-1
Volleyball	-8	-2	-5

The potential to increase recreation accessibility in these communities is shown in the following maps based on *The 2009 Knoxville-Knox County Park, Recreation and Greenways Plan*.



## SUMMARY OF INSKIP'S ACCESSIBILITY TO RECREATION

Inskip is one of the most deprived areas of the city in regard to recreation facilities. The Park, Recreation and Greenways Plan proposes several greenway connectors. Connections are proposed for the length of Adair Drive leading to Adair Park (which is just outside of the PRZ), from Inskip Elementary to Inskip Pool and Park, and along East Inskip Drive from the proposed Rowan Park to Central Ave Pike. The plan calls for a neighborhood park, Rowan Park, to be located near the intersection of Inskip Road and East Inskip Drive. A neighborhood park should be approximately 5-20 acres in size with spaces for active recreation activities, such as ball practice, and passive recreation areas for strolling, picnicking, and enjoying the outdoors. Rowan Park should be tailored to the needs of the surrounding Inskip community, which could be fields for softball, soccer and football. A prototypical neighborhood park design is shown in the site plan below.



Inskip Ballfields and Inskip-Norwood Recreation Center lie just outside the PRZ area for Inskip Elementary. These facilities provide volleyball, baseball and softball fields. These facilities are in the Northwest City Sector, while the bulk on Inskip is in the North City Sector, so the per sector analysis did not include these parks as part of the calculation toward meeting the NRPA guidelines, and the deficits shown in Table 2 may not be as significant for Inskip. The proposed greenway connections and addition of Rowan Park would significantly help the Inskip community achieve the NRPA standard of 6.25-10.5 acres of parks for every 1,000 residents, as well as any remaining recreation facility needs.

## SUMMARY OF LONSDALE'S ACCESSIBILITY TO RECREATION

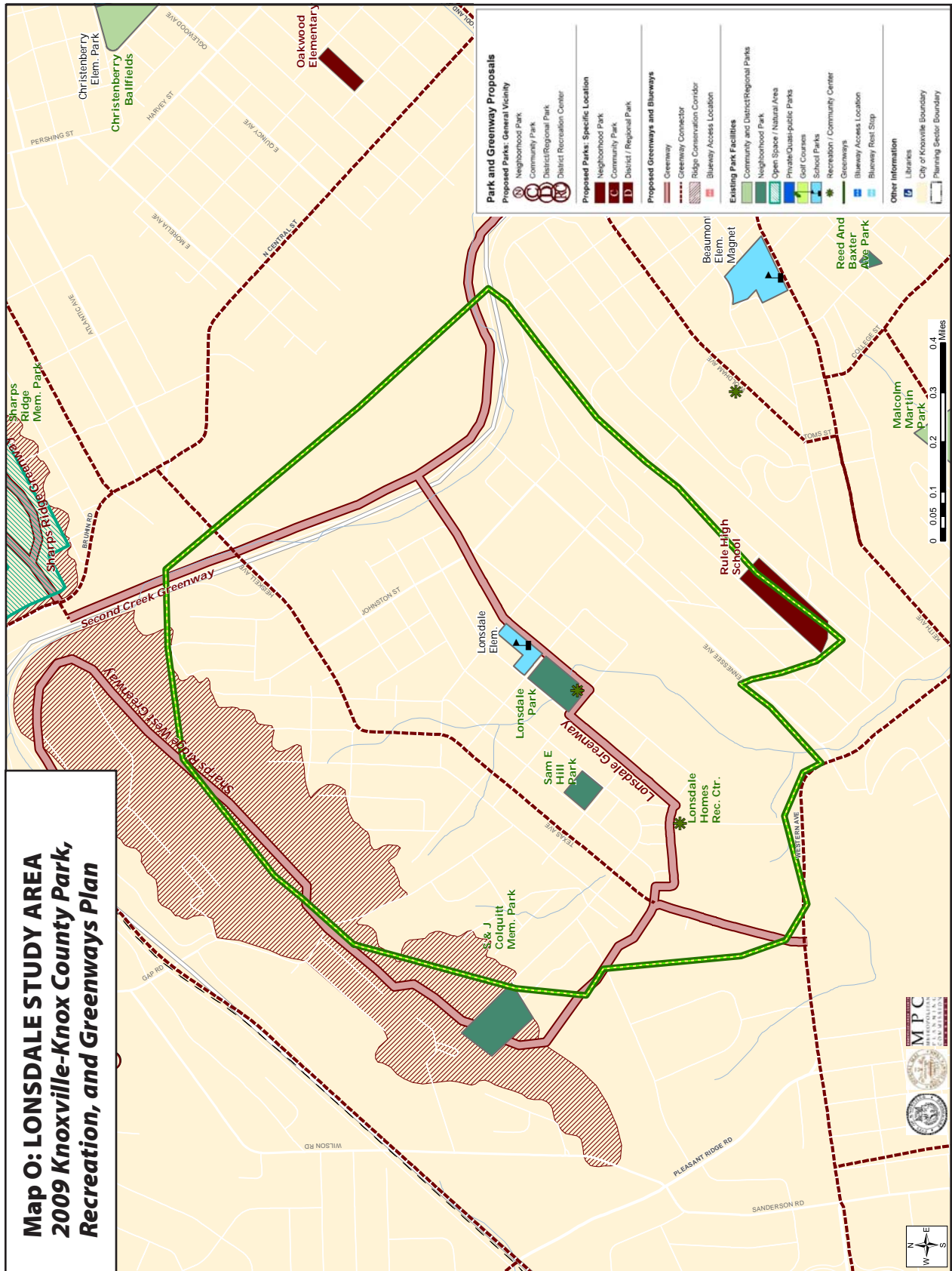
The 2009 Knoxville-Knox County Park, Recreation and Greenways Plan proposes greenways along Second Creek and Louisiana Avenue, which would create safe connections to Lonsdale Elementary, Lonsdale Park and Lonsdale Recreation Center. To further connect those areas, a greenway connector along Texas Avenue, which could include sidewalks, a side path greenway, or on-street bicycle facilities, is also proposed. The plan also proposes connections to Sharp's Ridge and an adjoining conservation corridor area. These connections and proposed conservation corridor areas will help the residents of Lonsdale reach the NRPA standard for acreage of close-to-home parks. The plan also proposes and expansion of Lonsdale Recreation Center to provide space for league basketball and other community uses. It also notes the potential to expand the gym facilities at Lonsdale Elementary School and allow for public access, which could be accomplished through a partnership between Knoxville City Parks and Recreation and the Knox County School Board. Reuse of former school grounds, such as those of Rule High School, could help the neighborhood reach the NRPA guideline for soccer, softball, swimming and volleyball facilities.

### The Lonsdale Greenway

The concept for the Lonsdale Greenway is included in the *Central City Sector Plan* and *Lonsdale Neighborhood Plan* (adopted with the *Lonsdale Redevelopment and Urban Renewal Plan*, November 2005).

The open space of the Greenway is to provide a buffer between the industrial properties and the residential portions of this neighborhood. The trail is to provide opportunities for recreation, health improvement and alternative forms of transportation.

As part of the planning process a vision and concept plan for the Lonsdale greenway were created.



## The Lonsdale Greenway Vision



### Ideal Setting:

- Natural setting
- Provision of open space for recreation activities
- Connectivity beyond neighborhood



### Compromise Setting:

- Narrower than ideal but nicely designed
- Sense of open space and natural setting retained



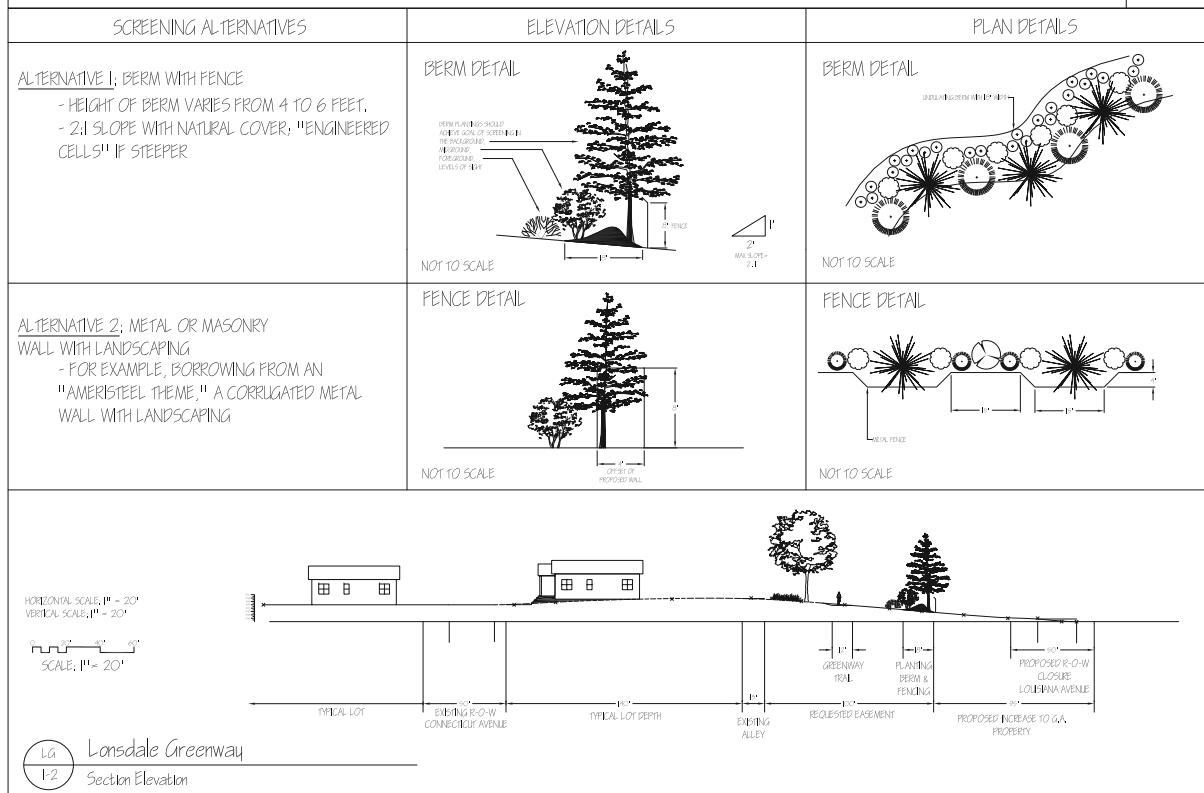
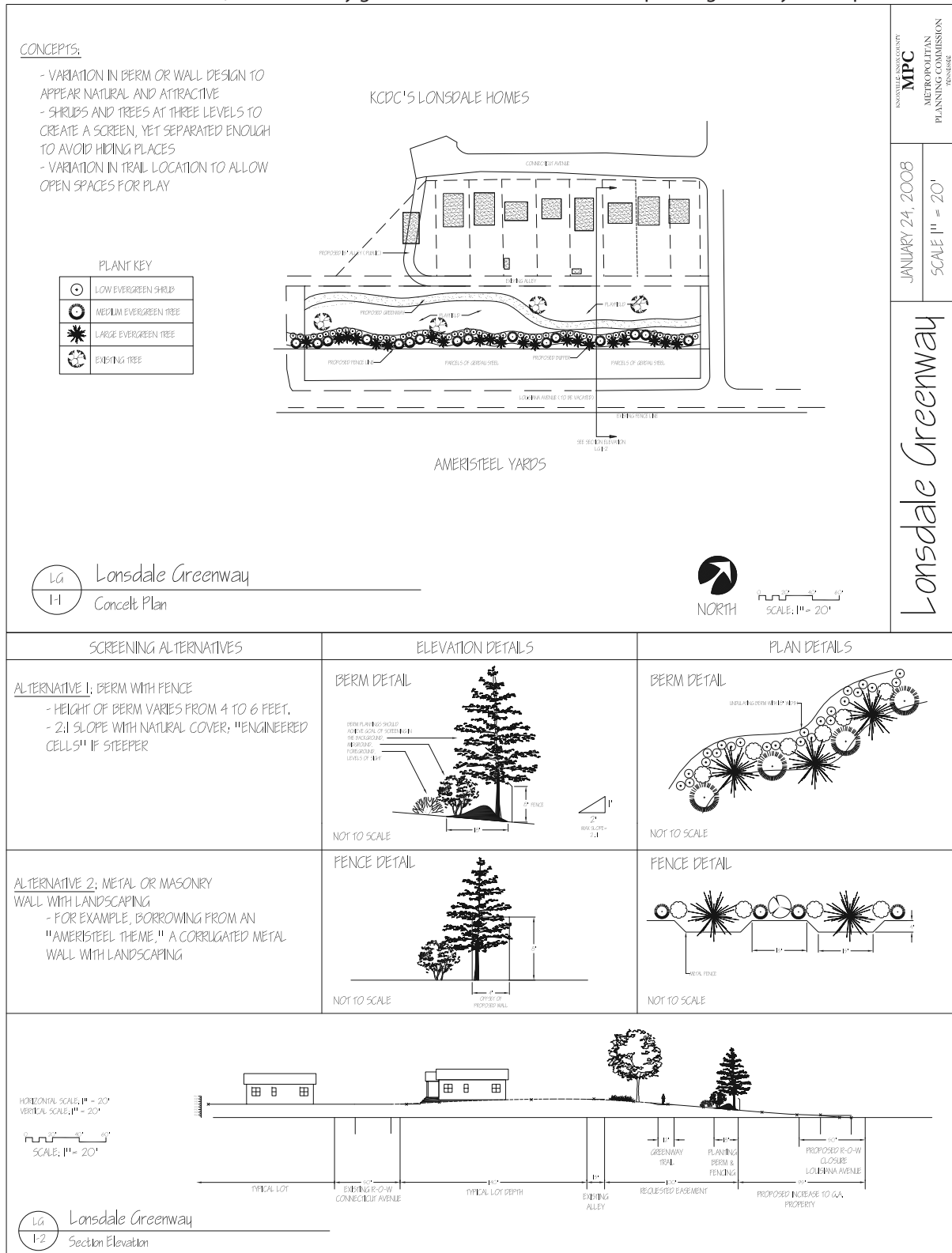
### Settings To Avoid:

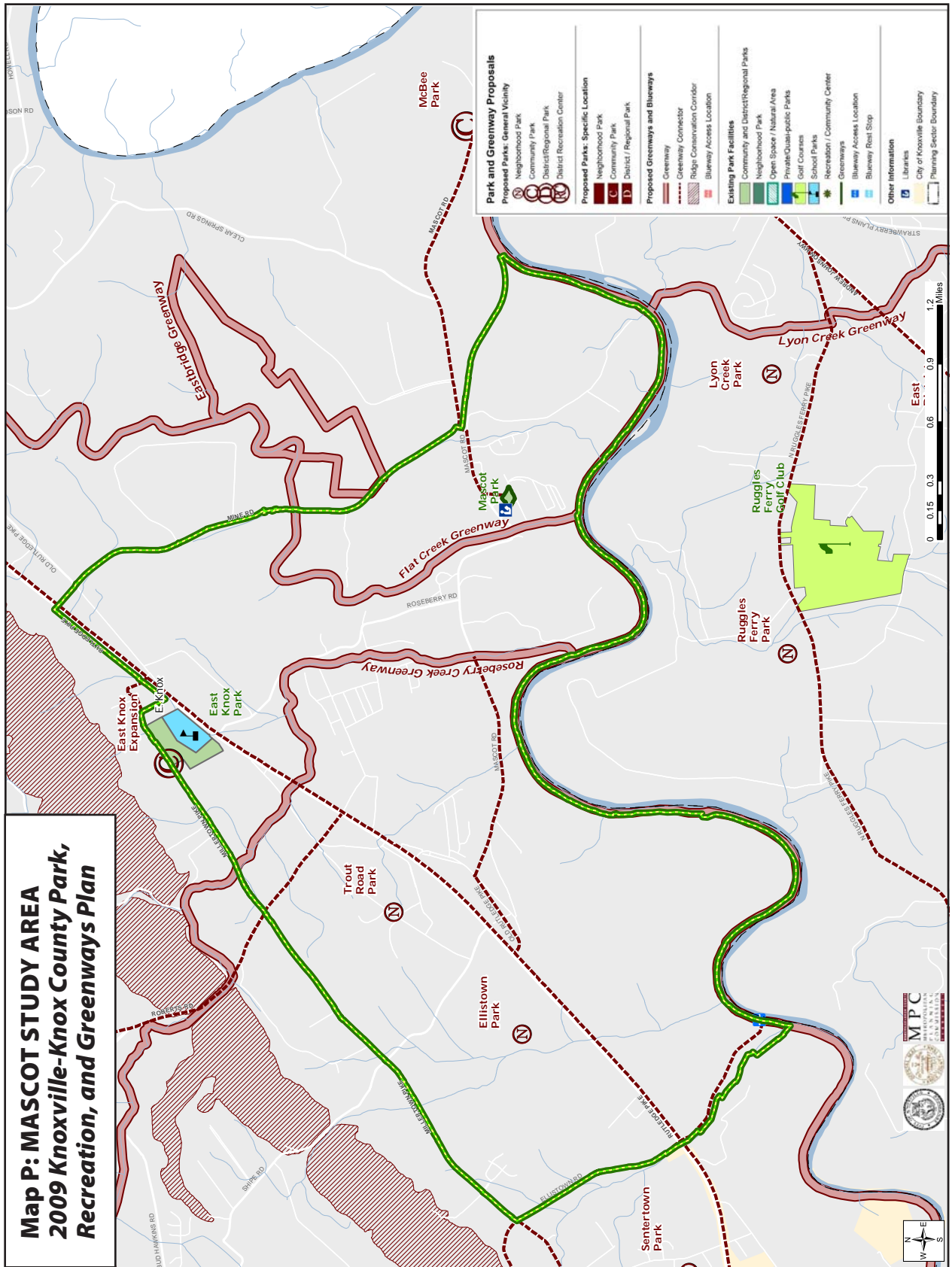
- Too narrow a corridor
- Aesthetics lacking
- Wedged too close to alley, roads, and buildings

### Recommendations:

1. Provide a combination of varying widths of open space, (minimum 50 feet wide) stretching to 100 feet or more in some locations
2. Landscape at alley and along fence line, yet leave open space for aesthetic and safety purposes

Presented below are aerial and elevation drawings showing details of the proposed Lonsdale greenway system. In an effort to also promote healthy eating, edible landscaping such as fruit trees could be substituted for other trees and shrubs, or community garden areas could be created as part of greenway development.

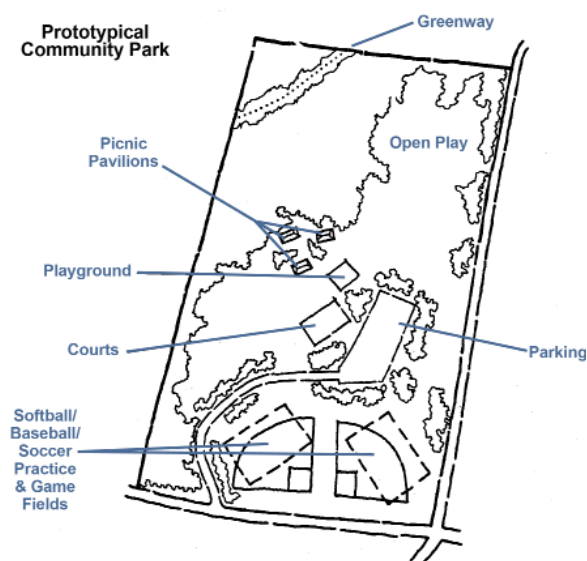




## SUMMARY OF MASCOT'S ACCESSIBILITY TO RECREATION

Mascot is one of the most deprived areas of Knoxville-Knox County in regard to recreation opportunities for the residents. The Park, Recreation and Greenways Plan proposes several greenways and greenway connectors, as well as two neighborhood parks and an expansion of the East Knox Park. The Northeast County Sector has only 3.35 acres of parks per 1,000 residents. This sector is currently lacking in basketball, football, soccer, softball, swimming, tennis and volleyball facilities. Creating the proposed neighborhood parks as shown in the Mascot study area as Trout Road Park and Ellistown Park would significantly help the residents of Mascot in increasing their access to recreation activities and reaching the NRPA standards. Acquisition and development of these parks would put many more residents in the Mascot area within walking distance of a park. The proposed expansion of East Knox Park, as a community park, would involve acquisition of 10 to 20 acres for additional recreational facility development. The expansion of the park provides a dual function of serving both East Knox Elementary School and the surrounding community. It could provide both active and passive recreation facilities, including athletic fields and courts for practice and games, or perhaps even a sports complex-style development to fulfill the needs of the residents of Mascot. A prototypical design of a community park is shown below demonstrating the many recreational facility types that could be provided within the expansion of East Park.

The proposed greenway for Roseberry Creek would connect existing and future neighborhoods to the Gibbs schools and to the proposed Holston River greenway. The proposed Flat Creek Greenway would connect to the proposed Beaver Creek Greenway, preserving the floodplain and connecting the Eastbridge Business Park and Mascot Park Millertown Pike, Rutledge Pike and Mascot Road should be improved to safely accommodate pedestrians and bicyclists and provide connections to greenways.





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*Thanks to Robert Hodge of El Puente for sharing photographs of the Lonsdale Community Garden.*

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