Strategies for Conserving the Green Infrastructure of Kilmarnock, VA

Prepared by the Green Lands Class at the University of Virginia

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UNIVERSITY *of* VIRGINIA

This is a report prepared by students in the University of Virginia's School of Architecture.

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INTRODUCTION

Green infrastructure is the interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas that support native species, clean water and contribute to community health and quality of life. Just as localities plan for grey infrastructure, they also need to take care of their green infrastructure to create healthful places for residents and businesses. For example, forests help to filter and absorb rainfall thereby reducing flooding frequency while also protecting streams and facilitating the recharge of groundwater supplies. Green infrastructure planning is a framework for assessing and valuing these environmental assets.

This report was prepared by students in an applied planning class titled Green Lands at the University of Virginia (UVA). This project is a collaborative partnership between the Green Infrastructure Center and UVA. It was funded by the Virginia Department of Forestry (VaDOF). Students proposed strategies for protecting environmental assets and landscape-influenced cultural resources.

Students worked in teams to evaluate the green infrastructure of the Town of Kilmarnock Virginia. Student teams conducted research, utilized natural resource data and the town's data. They used land cover mapped by the Green Infrastructure Center. Students who contributed to this report:

Shiyao Liu

Zhuoran Yang

Xiyu Liu

Zhiliang wang

Pin Hui Wang

Jiajing Lyu

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Goal Summary

Urban Forests and Habitats

Goal 1: Increase the tree canopy of Kilmarnock to improve walkability and provide habitat for birds and other native wildlife.

Water

Goal 1: Reduce street flooding and improve stream health with Low Impact Development.

Goal 2: Conserve water and reduce runoff by using water tanks to collect roof water for irrigation needs.

Recreation and Culture

Goal 1: Enhance the visibility of signage and public art to make residents and visitors more familiar with the town's history and culture, and lengthen the visitor stays.

Goal 2: Expand access to walkable recreation amenities, especially for elderly residents.

Goal 3: Enact corridor design standards to ensure harmonious development in keeping with Kilmarnock's small town historic character and to enhance the pedestrian experience.

Urban Forests & Habitats: Recommended Policies and Strategies

Written by Shiyao Liu& Zhuoran Yang

Rationale:

Trees are one of the best sources of green infrastructure to provide ecosystem services. As development and construction can cause fragmentation, fostering a healthy and continuous urban forest can increase ecological resilience. Expanding and caring for tree canopy will make the town more resilient by reducing impacts from urban heat island effects as temperatures warm and will intercept and uptake water from rainstorms.

Trees serve ecological functions such as filtering air and water. Trees act as sponges for a range of environmental pollutants, removing ozone and sulfur dioxide from the air, storing and sequestering carbon, while absorbing and transforming soil contaminants. For example, mature trees absorb 120-240 LBs of particulate pollution each year. (University of Washington, College of Forest Resources 1998) Urban trees in the US remove 711,000 metric tons of air pollution (O3, PM10, NO2, SO2, CO) annually, at a value of $3.8 billion. (Nowak, David, Daniel Crane, and Jack Stevens 2006)

Trees also create biodiversity by adding wildlife habitats. For example, a continuous tree pattern will provide migratory birds with nesting sites and safe migration routes and some species are also the food resources for small animals. Besides, the tree canopy can lower the urban temperature. Some studies suggest that trees can cool cities between 2-8 degrees.

For another thing, trees benefit human society like the physical and psychological health of people by providing shade, providing pleasant views, and reducing environmental stressors.

Temperatures of the same materials without shade, credit: Shiyao Liu

Temperatures of the same materials with shade, credit: Shiyao Liu

Continuous canopy will encourage people to do exercise outside. Research shows that residents of areas with the highest levels of greenery were three times as likely to be physically active and 40% less likely to be overweight or obese than residents living in the least green settings. (Ellaway, Anne, Sally Macintyre, and Xavier Bonnefoy 2005) Researchers from Columbia University found childhood asthma rates were highest in parts of the city where tree density was lowest. (Lovasi et al 2008). The rate of asthma fell by 25% for every extra 340 trees per square kilometer, a pattern that held true even after taking account of differing sources of pollution, levels of affluence and population density. In addition, trees near the buildings can cut air conditioning use by 30% and reduce the heating use by 20-50%, which brings great economic benefits. (Feder 2019) Shade provided by trees reduces the need for maintenance and repaving. A study by Davis found that, 20% shade on a street improves pavement condition by 11%, which is a 60% savings for resurfacing over 30 years (Geiger and Gardner 2006)

In order to utilize tree canopy as green infrastructure, setting planting standards is an opportunity to explore new ways to meet the goals of canopy growth and environmental equity in Kilmarnock over the long-term, ideally through the planting of long lived, healthy, appropriately placed, large-

shade trees. Creating an ordinance for a tree removal permit also preserves more mature trees on private property which ensures the coverage and continuity of tree canopy.

The selection of trees should follow adaptability and diversity principles: combine the native and introduced species and avoid single-species planting. These strategies will enhance the resilience of the whole system as well as beautify the town appearance.

> GOAL 1: INCREASE THE TREE CANOPY OF KILMARNOCK TO IMPROVE WALKABILITY AND PROVIDE HABITAT FOR BIRDS AND OTHER NATIVE WILDLIFE.

Objective 1: Plant more trees along the streets that connect communities and parks.

> **Action 1:** Plant large trees along Main Street, especially the connection between the Central Park, Kilmarnock museum and the Library; and School Street that connects several educational institutions. so that passengers can enjoy continuous green views and shade.

> **Action 2:** Encourage residents to plant more trees in front yards that can also beautify the street appearance.

> - Help residents plant trees near the roadside.
> - Encouraged residents to add plant species to their front yards to enrich the landscape.

> **Action 3:** Connect committees and private donation for new trees and small parks. For private ownership (80%), the government can encourage personal and communal planting activities and events to build a more pleasant living environment.

> - Hold planting activities and open related natural science classes in schools to enhance environmental awareness of the younger generation.
> - Host events such as Arbor Day to encourage participation and other regular planting events.
> - Link to web content to help residents to learn about plants and importance of the trees. https://treesvirginia.org/

Objective 2: Amend the street tree maintenance plan to ensure their longevity and health.

> **Action 1:** Adopt proposed street tree species and street tree planting standards

> Choosing the right street tree species can result in a longer lifespan. For example, Asian pear trees are fine trees but are not appropriate for streets because they split and lose their branches. So in a storm, these trees will be at high risk, especially in Kilmarnock as a high point with a lot of wind. Another example of an inappropriate street tree is the red maple. Although chosen as street trees because of its beautiful color, red maples are a bad tree species for a street because they don't do well with heat stress from pavement. Appropriate street trees should not be messy and drop limbs easily. For example, the sweet gum and chestnut oak can drop fruits or seeds which interfere with walking experience. Similarly, the hackberry often drops limbs which is dangerous to pedestrians.

> Species should be selected to fit the planting sites, taking into consideration soils and rooting space, overhead space, adjacent utilities and buildings, drainage, ability to reduce pollution problems, and other site conditions.

Setting planting standards is an opportunity to explore new ways to meet the goals of canopy growth and environmental equity in Kilmarnock over the long-term in order to make sure the green infrastructure works well. For example, on average, about half of street trees in America that are planted die after 9 years. The reason why they die is because trees are planted into spaces that too small to grow big and the roots do not have enough room. So they grow for a while and they run out of the space and nutrition. Also, some of the trees are damaged in Kilmarnock's Central Park due to the wrong tree maintenance. They did what's called volcano mulching where the mulch is piled up against the tree trunks like a volcano and that will cause disease to occur because it traps moisture against the tree trunk which allows decay to occur. Mulch should be spread around the tree but not against the trunk. The image at right shows a tree in Central Park that has been "volcano mulched" putting the tree at risk.

Right-of-way planting site size standards in other cities are the result of decades of urban forest management experience and research, which have found that smaller spaces reduce tree longevity and productivity and increase the risk of public safety hazards.(Appendix B: Street Tree Species List and Appendix C: Tree Planting Standards)

Action 2: Amend the City's current tree maintenance plan with its contractors:

1. A detailed tree planting and maintenance plan must be prepared by a qualified professional and coordinated with local agencies to avoid conflicts.

2. Utilities must be indicated on the plan, and where underground utilities may be present the local utility must be contacted prior to planting.

3. A minimum of one-year warranty is required on all stock contracts.

Trees should be maintained for a minimum of three years to ensure survival. Tree maintenance is particularly important through the growing season. Watering is especially important and must be planned. (Appendix C: Tree Planting Standards)

Action 3: Add Ordinance for Tree Removal Permits in Kilmarnock

People living in Kilmarnock are not currently required to get permission before removing any trees on their private property. A tree removal permit can help to preserve more mature trees on private property. See the example Appendix D: Herndon Va Tree Ordinance, Removal Permit)

MAPS

On the following pages are maps created to evaluate the town's green infrastructure and show where strategies, such as planting trees on streets that have less shade cover, are needed.
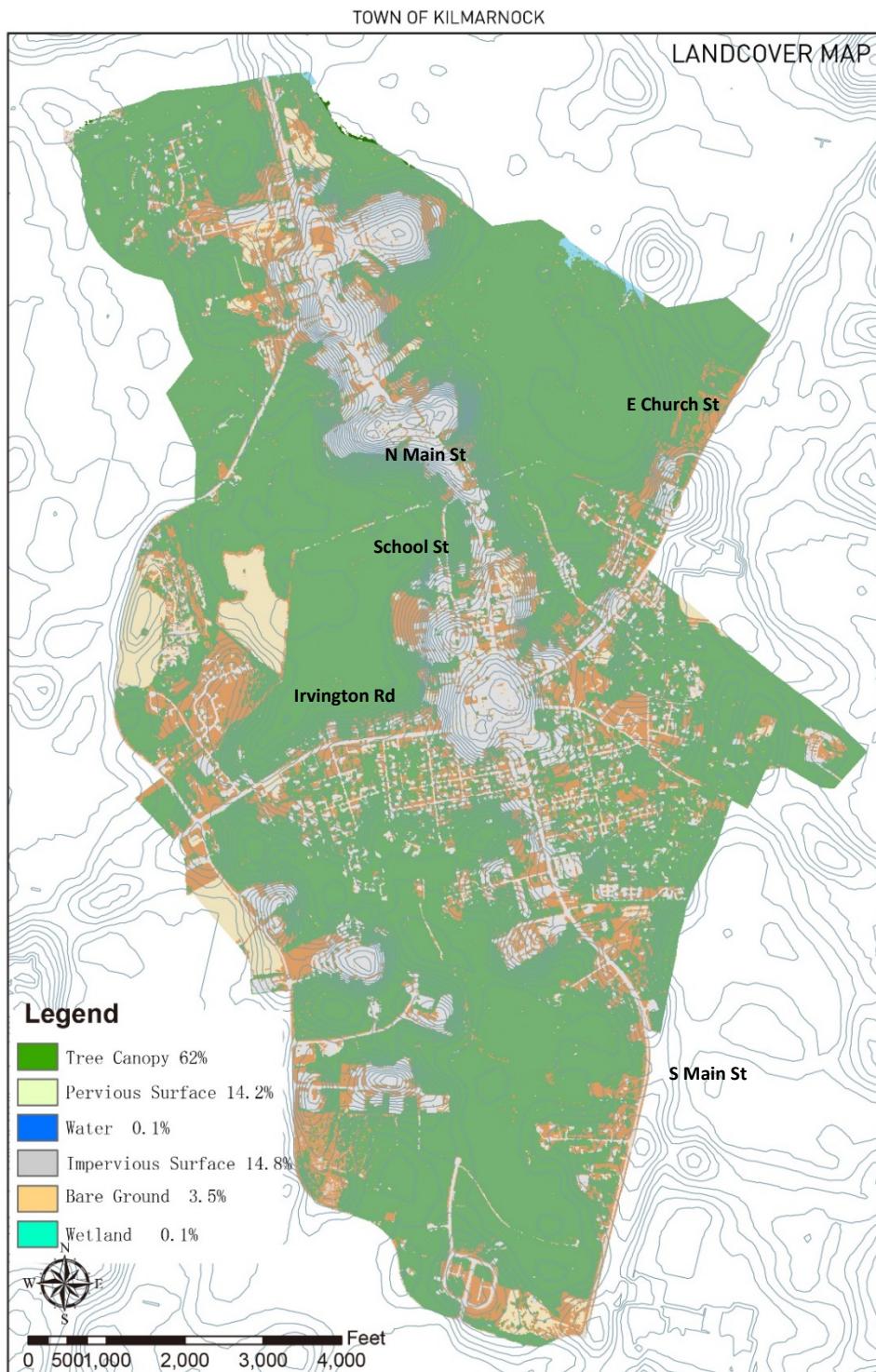
The coverage rate of canopy is as high as 62%, but most of the canopy is located around the town rather than in densely populated areas where canopy is lower.

TOWN OF KILMARNOCK

EXISTING STREET--TREE CANOPY MAP

E Church St

N Main St

School St

Irvington Rd

S Main St

Legend

	Kilmarnock boundary
	Main road
	kilmarnock_building_outlines

Streets_ExistingTreeCanopy

— 0% - 20%
— 20.1% - 40%
— 40.1% - 60%
— 60.1% - 80%
— 80.1% - 100%

Feet
0 500 1,000   2,000   3,000   4,000

TOWN OF KILMARNOCK

PLANTING PRIORITY AREA

E Church St

N Main St

School St

Irvington Rd

S Main St

Feet

0 500 1,000   2,000   3,000   4,000
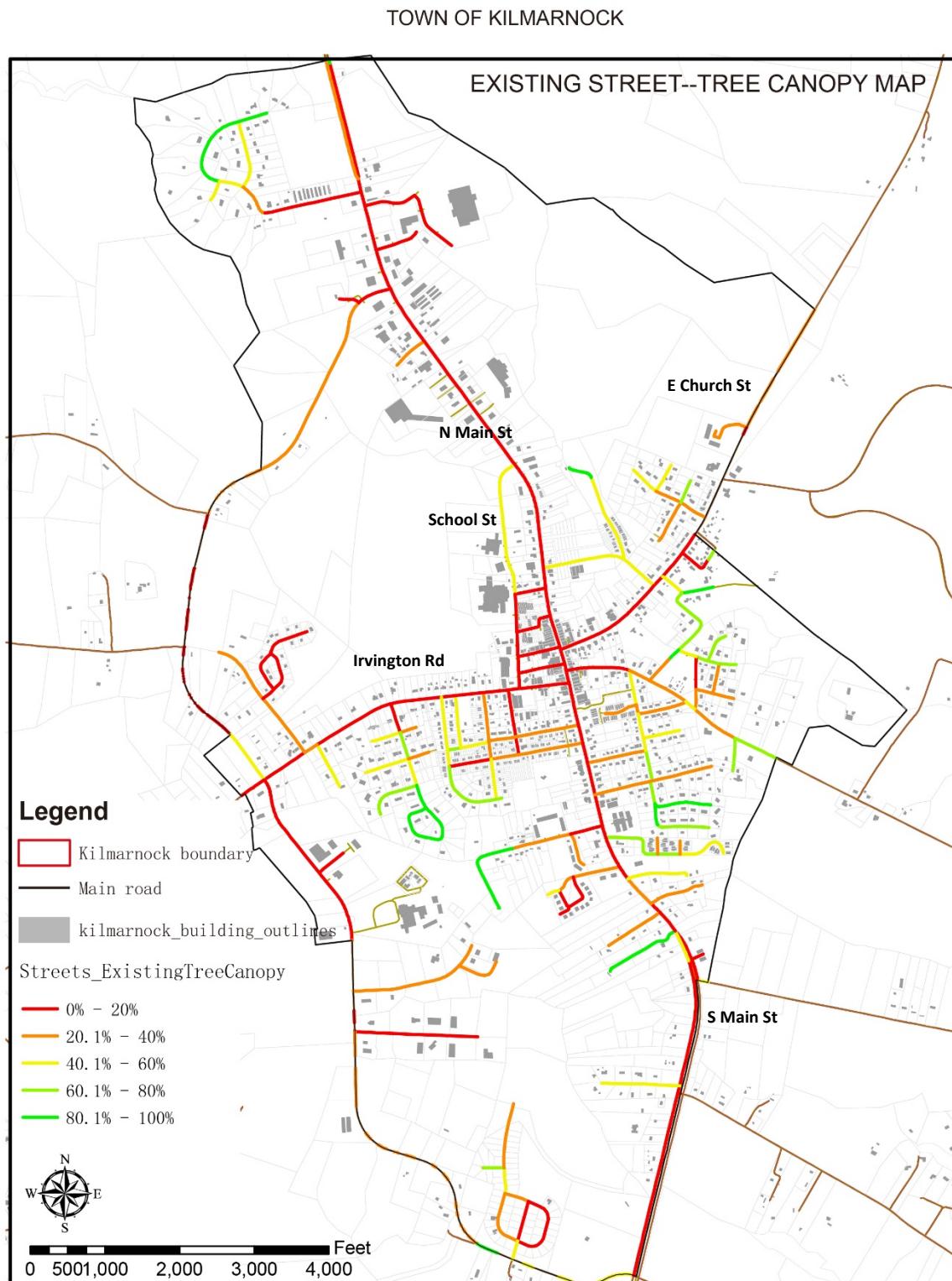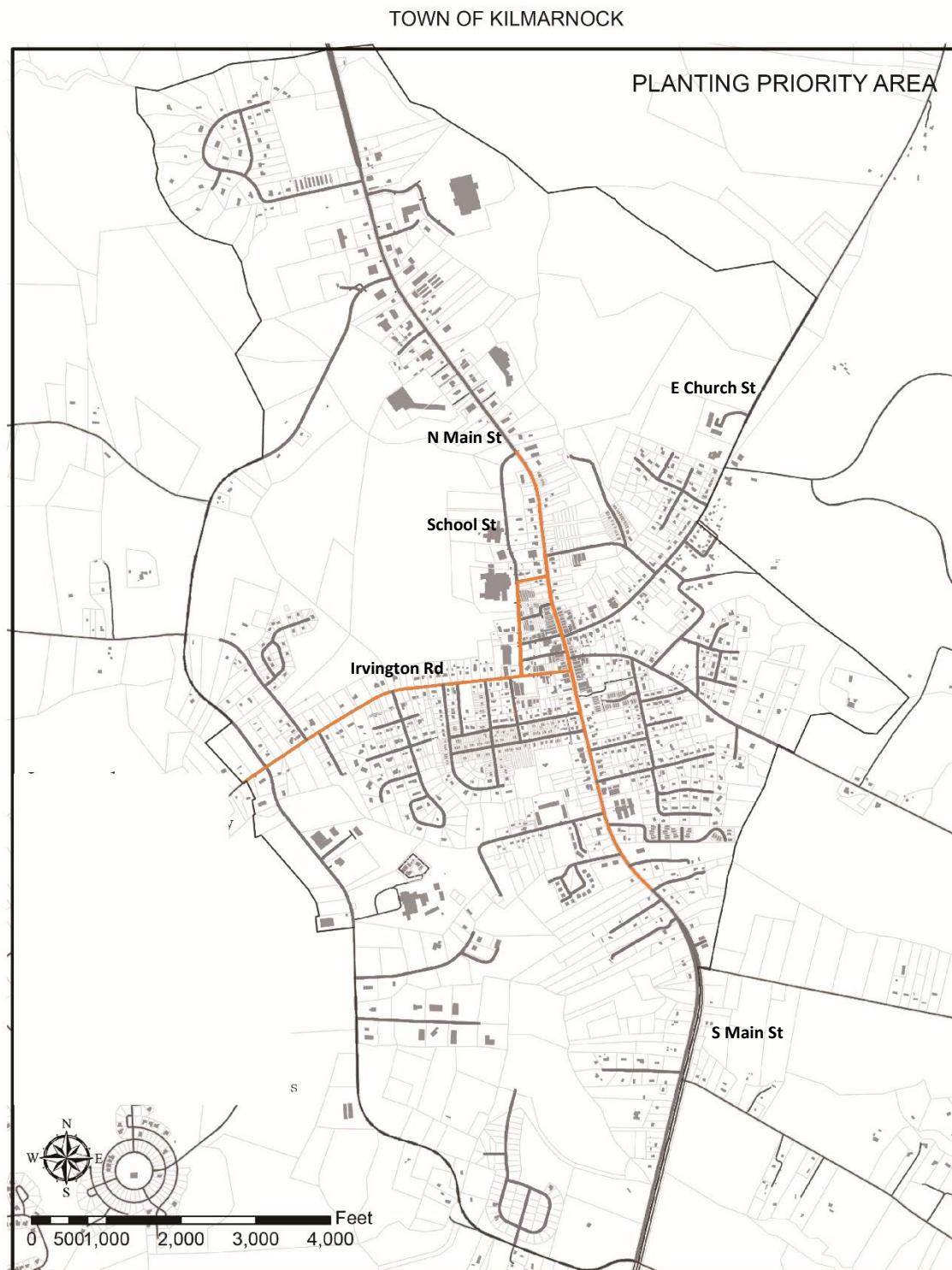
TOWN OF KILMARNOCK

POTENTIAL STREET--TREE CANOPY MAP

E Church St

N Main St

School St

Irvington Rd

S Main St

Legend

Kilmarnock boundary

Main road

kilmarnock_building_outlines

Streets_PotentialTreeCanopy

0% - 20%

20.1% - 40%

40.1% - 60%

60.1% - 80%

80.1% - 100%

N
W E
S

Feet
0   500 1,000   2,000   3,000   4,000

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TOWN OF KILMARNOCK

EXISTING BARE AREA MAP

E Church St

N Main St

School St

Irvington Rd

S Main St

Legend

Kilmarnock boundary

Main road

Existing bare area

kilmarnock_building_outlines

N
W E
S

Feet

0   5001,000   2,000   3,000   4,000

TOWN OF KILMARNOCK

FUTURE PLANTING MAP

E Church St

N Main St

School St

Irvington Rd

S Main St

Feet

0 500 1,000   2,000   3,000   4,000

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E Thomas Smiley and Bartlett Tree Experts, "Soil for Urban Tree Planting," n.d., 3.

Feder, Sarah. "Pluralities and Pines: An Exploration of Immigrant Integration in the Catalonian Forest Sector." (2019).

Lovasi, Gina Schellenbaum, James W. Quinn, Kathryn M. Neckerman, Matthew S. Perzanowski, and Andrew Rundle. "Children living in areas with more street trees have lower prevalence of asthma." *Journal of Epidemiology & Community Health* 62, no. 7 (2008): 647-649.

David J Nowak, "Tree and Forest Effects on Air Quality and Human Health in the United States," Environmental Pollution, 2014, 11.

Resources

Web Links

Virginia department of forestry:

https://www.dof.virginia.gov/tree/care/index.htm

Med Forest

http://nrcsolutions.org/urban-forests-trees/

Tree City USA Program:

https://www.arborday.org/programs/treecityusa/index.cfm

Norfolk, Virginia Bay Star Homes Program:

http://askhrgreen.org/programs/bay-star-homes/

Herndon Va Tree Ordinance, Removal Permit & City Arborist

http://www.treeremovalpermit.com/virginia/herndon-ordinance-permit-arborist/

Virginia Urban Street Tree Selector

https://dendro.cnre.vt.edu/dendrology/treeselector.cfm

Virginia's Urban Forest Council

https://treesvirginia.org/

American Standard for Nursery Stock

https://cdn.ymaws.com/americanhort.site-ym.com/resource/collection/38ED7535-9C88-45E5-AF44-01C26838AD0C/ANSI_Nursery_Stock_Standards_AmericanHort_2014.pdf

Street Tree Planting Standards for New York City

https://www.nycgovparks.org/pagefiles/53/Tree-Planting-Standards.pdf

Street Tree Planting Standards - City of Portland, Oregon

https://www.portlandoregon.gov/trees/article/496924

Common native trees of Virginia

https://www.dof.virginia.gov/infopubs/Native-Tree-ID_2020.pdf

Native Trees of VA

https://www.inaturalist.org/guides/3190

FUNDING

Virginia Department of Forestry: Provides funds for tree planting and offers technical assistance

   See http://www.dof.virginia.gov/financing/grants.htm

U.S. Forest Service Grants

   See https://www.fs.usda.gov/working-with-us/grants

land and water conservation fund

   See https://www.doi.gov/lwcf

Tree City USA(need to meet 4 standards)

   See https://www.arborday.org/

VOLUNTEER ORGANIZATIONS
Volunteers: Kilmarnock Garden Club HTTPS://WWW.FACEBOOK.COM/GARDENCLUBNORTHERNNECK/

APPENDIXES

APPENDIX A: PLANTING EXAMPLES

1. Main St
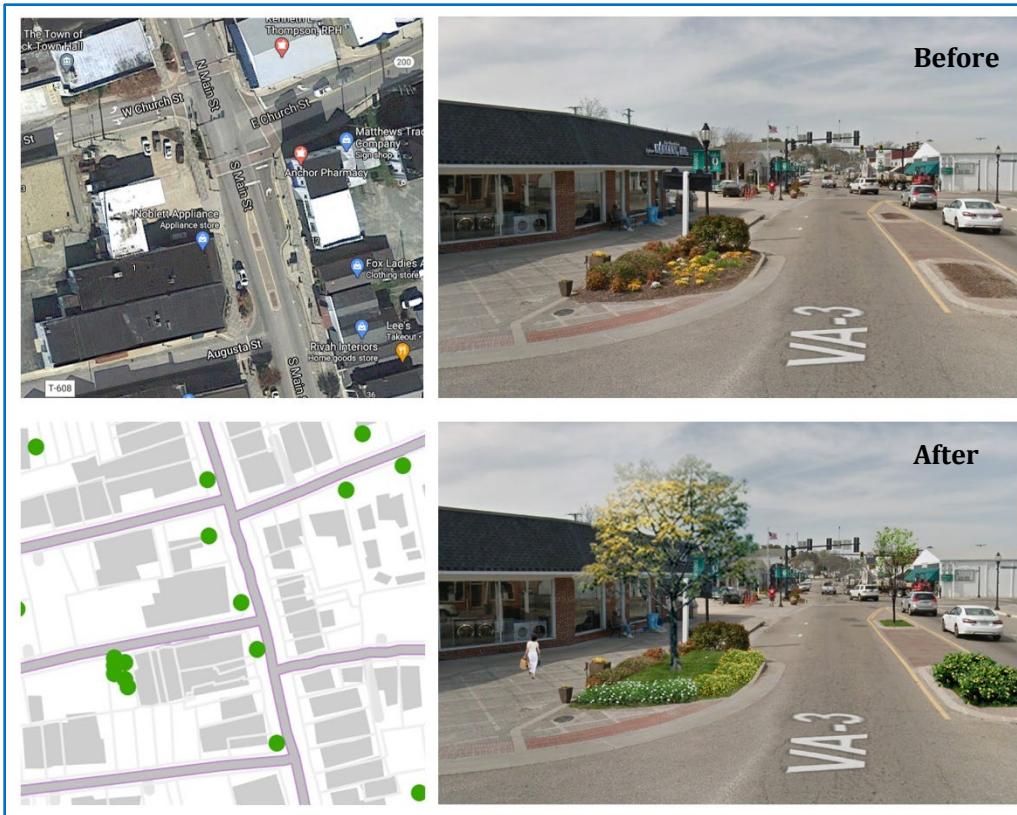
2. **School St**

APPENDIX B: STREET TREE SPECIES LIST

TREE SPECIES		Type	Form	Mature Size(WxH)	Growth Rate
Scientific Name	Common Name				
Betula nigra	River Birch	Deciduous canopy tree	pyramidal	50x60	Fast
Carpinus caroliniana	American Hornbeam	Deciduous canopy tree	rounded	30x30	Slow
Carya spp	Hickory species	Deciduous canopy tree	Oval, Round, Upright		Slow
Cladastrus kentukea	American yellowwood	Deciduous medium tree	rounded	40x30	Medium
Fagus grandifolia	American Beech	Deciduous canopy tree	Pyramidal, Rounded	40x50	Medium
Ostrya virginiana	American hophornbeam	Deciduous canopy tree	Pyramidal, Rounded	30x40	Slow
Quercus alba	White Oak	Deciduous canopy tree	rounded	60x60	Slow
Qrubra	Northern Red Oak	Deciduous canopy tree	rounded	60x50	Fast
Qcoccinea	Scarlet Oak	Deciduous canopy tree	rounded	60x45	Medium
Qphellos	Willow Oak	Deciduous canopy tree	rounded	60x40	Fast
Ginkgo biloba	Maidenhair tree Male cultivars only	Deciduous canopy tree	upright	50x50	Slow
Platanus × acerifolia	london planetree	Deciduous canopy tree	Broad, Pyramidal	70x70	Fast
Tilia americana	American Linden	Deciduous canopy tree	rounded	50x35	Medium
Amelanchier arborea	Downy Serviceberry	Deciduous	Narrow		Medium
Amelanchier x grandiflora	Hybrid Serviceberry	Deciduous	rounded		Medium
Cercis canadensis	Eastern Redbud	Deciduous	Irregular,rounded	35x30	Medium
Cornus florida	Flowering Dogwood	Deciduous	Broad, Rounded	20x40	Slow
Acer pseudoplatanus	Sycamore maple	Deciduous canopy tree	rounded	60x60	Medium
Taxodium distichum	bald cypress	Deciduous canopy tree	pyramidal	60x25	Fast
Gleditsia triacanthos	Honey locust	Deciduous canopy tree	irregular	30x35	Fast

Proposed street tree species list

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Street Tree Planting Standards

Species Selection

Growing conditions and microclimates can vary from location to location within neighborhoods and across the city. Species selection should take into account site conditions, design goals, and diversity goals. In choosing a species, the mature height and spread shall be considered to ensure that it will not interfere with existing or proposed structures and overhead utilities. The final selection of the species is made by the Forester. Town will not allow large trees to be planted under primary wires and discourages small trees in large open spaces.

Spacing Requirements

The following requirements shall be followed when sitting tree pits along sidewalks. These guidelines generally follow regulations of other agencies with jurisdiction or infrastructure on the right-of-way. These requirements are design and tree species dependent. The American with Disabilities Act (ADA) guidelines must also be followed.

a. Do not plant in front of building entrances in order to permit easy access by the Fire Department.

b. Do not plant within bus stops.

c. Do not plant within no standing zones

d. Do not plant directly over DEP water mains less than 20 inches in diameter. e. Minimum horizontal distance from DEP water main to tree trunk is 6 feet.

f. Minimum distance between trees (trunk to trunk) shall be 20 feet to 30 feet, depending upon the tree species and other local conditions.

g. Minimum distance from a streetlight or utility pole to the tree trunk is 25 feet (this may vary with tree species).

h. Minimum distance from a stop sign to the tree trunk is 30 feet.

i. Minimum distance from other traffic signs to the tree trunk is 6 feet.

j. Suggested distance from a parking meter back to tree trunk shall be no more than 5 feet, to allow for the swing of car doors.

k. Minimum distance from a gas or water valve to the edge of the pit is 2 feet.

l. Minimum distance from an oil fill pipe to the edge of the pit is 4 feet.

m. Minimum distance from a fire hydrant to the edge of the pit is 3 feet.

n. Minimum distance from a curb cut or driveway to the edge of the pit is 2 feet and to the the tree trunk is 7 feet.

o. Minimum distance from the corner of a street intersection to the tree trunk is 40 feet.

p. Minimum distance from the edge of the pit to any opposite obstruction (building wall,

stoop, railing, property line etc.) is from 4 to 6 feet, depending upon local conditions and the amount of sidewalk traffic

q. All tree pits must be contiguous to the street curb (except as noted below, or with the permission of the Forester).

r. Trees may be planted on either side of sidewalks (if any exist) in lawn areas where there is sufficient room between the property line and the street curb.

Tree Pit Dimensions

Tree pits should be as large as possible to allow for ample growing space for the tree's roots and to reduce the likelihood of future sidewalk lifting. The standard street tree pit size is 5 feet by 10 feet. The overall width of a sidewalk can limit the size of a tree pit. Where a 5 feet by 10 feet tree pit is not possible, alternate dimensions must be approved by the Forester.

The installation of continuous tree pits is encouraged whenever possible, and design proposals that call for continuous tree pits may be given more flexible spacing requirements by the Forester

Soil Volume Requirements

The amount of soil installed will in large part determine the maximum size that the tree will achieve during its usable life span. To determine soil volume required, see the table below prepared by James Urban (Up by Roots, ISA Press, 2008). Only the upper three feet of soil should be used for calculations in this table. The example illustrated shows that to achieve a trunk diameter of 16 inches (40 cm), 1000 cubic feet (28 m3) of soil are needed
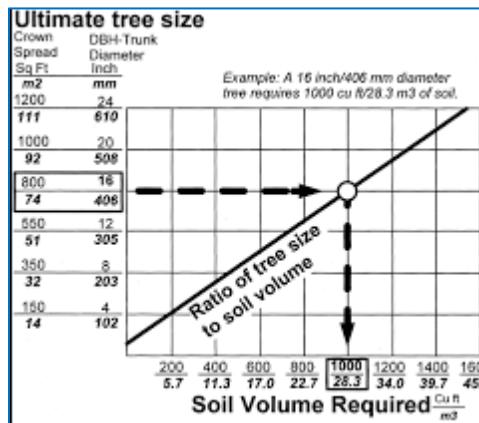
Tree size to soil volume relationships (Urban 1992)

Soil Depth

Tree soil should have a minimum depth of 3 feet (1 m). The soil can be composed of topsoil and subsoil layers. When installing the soil, it should be installed in lifts or layers of < 12 inches (30 cm). A subsoil mix should be installed first, and this should be covered with a topsoil mix with a depth of at least 12 inches (30 cm). When installing lifts, the base soil surface should be tilled or scarified with the teeth of an excavator bucket initially and between each lift to break up any compaction that occurred.

Tree Maintenance Requirements

1. Trees must have protection and maintenance in place that meets or exceeds ANSI A300 Standards for Tree Care Operations standards.

2. Trees will be inspected every 6 months to evaluate general health and disease and insect problems.

3. Treat disease and insect problems as needed to maintain tree health.

4. Water during the growing season. When watering, plan five gallons of water plus five gallons for every additional diameter inch of the tree trunk per week. For example, if a tree has a trunk diameter of 2 inches, provide 10 gallons of water slowly over the root zone.

5. Trees will be pruned as needed to remove dead, damaged, or poorly located limbs using accepted practices of industry (American National Standards Institute (ANSI) A300 (Part) 2008 Pruning for Tree Care Operations Tree, Shrub, and other Woody Plant Maintenance Standard Practices (Pruning).

6. Trees will be fertilized as needed. Do not fertilize during the first two or three growing seasons, and then, only if the tree needs it. This can be determined with a test done by a soils lab.

Appendix D: Herndon Va Tree Ordinance, Removal Permit

A tree removal permit may be required to remove a tree within the Town of Herndon Virginia. If your postal zip code is 20170, you are considered to be in the Town of Herndon, with some exceptions near Town limits. Property outside Town limits falls under the jurisdiction of Fairfax County.

Below you will find specific details and information regarding Herndon tree ordinance statutes, and the process for acquiring a removal permit when needed.

Tree Removal Permit Regulations for Residential Private Property

Private, commercial, and multi-family property owners in the Town of Herndon must acquire a tree removal permit for the lawful removal of protected trees within a Resource Protection Area (RPA).

In the absence of an RPA, property owners within the Town of Herndon ARE NOT required to attain a tree removal permit or notify the Town of the removal of trees on their property.

The following offers guidance for lawful tree removal and how to handle fallen trees.

Troubled, Diseased, Dead or Dying Trees – These trees (once identified by a property owner) should be addressed as quickly as possible.

The Town of Herndon's Community Forester may require (by official notification) that a property owner take action on such a tree. Especially in cases where the tree poses an eminent threat to structures, people, and its surrounding ecosystem.

Typically, the property owner is given 15 days to comply with the notification. Noncompliance is considered unlawful, and after such time has elapsed, the Town shall have the authority to remove such tree and charge the cost of that removal to the owner.

Protected Tree(s) on Private Property – Trees found along streams, watershed, easements, or other Resource Protection Areas (RPA) will require submission of an RPA permit application before any trimming, pruning, or removal activities may be performed.

For landscape improvement or construction, that is located on land that includes a Resource Protection Area, an RPA permit must be acquired.

Fairfax County's Land Development Services – Customer and Technical Support Center should be contacted at (703) 222-0801 (option 2) for permitting and land disturbance support.

When in doubt, the Town's Community Forester can be contacted to evaluate the location of the tree and offer further guidance.

Tree (on Town Property) Falls Onto Private Property – In this case, immediately notify the Community Forestry Department of the Town of Herndon at (703) 787-7380. A crew will be dispatched to remove the tree (in most cases, they will remove the tree in its entirety).

If the fallen tree caused physical damage to structures, inflicted bodily harm, or death on any person, file a claim using an e-claim form or mail a claim form to the Town Attorney (within 6 months of the occurrence). Pictures should be taken of the damages along with detailed documentation.

Tree (on Private Property) Falls Onto Town Property – The property owner is responsible for the portion of the tree up to the property line. After having notified the Community Forestry Department, they will dispatch a crew to remove the portion of the tree on Town property up to the private property line.

The Town will document any physical damage to structures, bodily harm, or death caused by the tree's falling. Subsequently, the Town Attorney may file a claim against the property owner's insurance policy.

Tree (on Private Property) Falls Onto Adjacent Private Property – The property owners are responsible for the portion of the tree that is on their respective property. Each should contact their homeowner's insurance providers.

From where the tree(s) originated is irrelevant. However, if the property owner was previously notified of the tree posing an immediate threat, that property owner may be responsible for any and all resulting damages and injuries.

A Permit May Be Required for Commercial and Multi-Family Property
Within the Town of Herndon, commercial and multi-family properties are considered private property. The above guidelines for a private property owner may be applied here as well.

Town of Herndon and Fairfax County Tree Removal Permit Application Process for Trees in an RPA

The following will assist you in the lawful removal of dead, dying, diseased, or hazardous trees from RPA's located on private property.

To determine whether or not an RPA (Resource Protected Areas) is located on your property, visit this digital map of Fairfax County: https://www.fairfaxcounty.gov/gisapps/DMV/Default.aspx

In the dropdown menu "Map Legends" select "Chesapeake Bay". This will open the legend for Chesapeake Bay Preservation Areas as seen here.

Chesapeake Bay preservation area map legend

Once you have located your property on the map and found that the trees on your property are in an RPA, take the following actions:

For Dead, Dying, Diseased trees – You are permitted to remove them by hand and replace them with similar vegetation.

When in doubt, you should request that a County representative evaluate the trees and provide recommendations by contacting Land Development Services – Customer and Technical Support Center at (703) 222-0801 (option 2) for permitting and land disturbance support.

For Healthy Living Trees – The removal of healthy trees from RPA's located on private property should only be done after consulting the Chesapeake Bay Preservation Ordinance which further defines RPA tree removal restrictions.

For trees protected under this ordinance located in the Town of Herndon, the submission of a Town of Herndon Virginia RPA permit application will be necessary.

For trees protected under this ordinance outside Town limits, a "Removal of Vegetation in a Resource Protection Area Application Form" must be submitted to Fairfax County and can be found here.

Applications proposing removal of 3 or more trees will require a letter from a Certified Arborist.

This application and all required documentation should be submitted to the Fairfax County Land Development Services Department.

Tree Removal Permit in The Town of Herndon – Within the Town of Herndon, a tree removal permit is necessary when:

A healthy tree is to be removed and is located within an RPA on private property.
When tree removal activities are for timber harvesting purposes.

Handling Emergency Trees on Public Property, Sidewalks, Power Lines and City Streets
Dead, dying, or hazardous trees on town property or in the public right-of-way should be addressed as follows:

Emergency Tree Removal from the Street or Public Property – When storm-damaged limbs or a fallen tree is encountered in the roadway or on public property and that tree poses an immediate hazard, call 9-1-1.

Power Line or Utility Interfering Tree – Trees that pose a hazard to utilities and power lines should be reported to Dominion Energy (866) 366-4357 (option 1).

NOTE: Never make contact with a tree that is touching power lines, as they may become energized and cause serious harm or electrocution.

Notification of Nuisance Trees – When you identify a troubled, diseased, dead, or dying tree on public property, notify the Herndon, Va Community Forestry Department at (703) 787-7380.

Herndon's Town Services "Report A Problem" is a Customer Relationship Management (CRM) system that may also be used to report nuisance trees.

WATER: RECOMMENDED POLICIES AND STRATEGIES

Written by Zhiliang Wang and Xiyu Liu.

RATIONALE:

Water is one of the most important resources for humans and nature. However, excess water runoff from storms can cause flooding as well as pollution of streams. Kilmarnock is at the headwaters of three different waterways: the Corrotoman River (Norris Prong), Dymer Creek, and Indian Creek. The Town is drained by four basins, none of which is tidal. The four drainage basins are part of three larger watersheds. Each drainage basin is divided roughly along a major highway. Located at 90' above sea level, Kilmarnock does not have issues from sea level rise. However, most of the town was built before stormwater runoff requirements and so many areas have no stormwater management facilities or best management practices. Following are strategies to help residents improve water make a better living condition with water.

GOAL 1: REDUCE STREET FLOODING AND IMPROVE STREAM HEALTH WITH LOW IMPACT DEVELOPMENT.

Rationale:

Low-impact development is a term used in the United States to describe a land planning and engineering design approach to manage stormwater runoff as part of green infrastructure. LID emphasizes conservation and use of on-site natural features to protect water quality. This approach implements engineered small-scale hydrologic controls to replicate the pre-development hydrologic regime of watersheds through infiltrating, filtering, storing, evaporating, and detaining runoff close to its source. Green infrastructure investments are one approach that often yields multiple benefits and builds city resilience.(Wikipedia)

This is a good way of developing water management without expensive construction of new stormwater facilities since LID entails smaller scale opportunities for infiltration. They are appropriate for Kilmarnock which doesn't have stormwater management. Especially along the Main St where flooding happens.

Permeable parking lots in Central Park

Objective 1: Redesign the stormwater basin to increase the water storage ability and also reduce water pollution.

RATIONALE:

Stormwater basins are impoundments or excavated basins for the short term detention of stormwater runoff from a completed development area followed by controlled release from the structure at downstream, to replicate pre-development flow rates. In the urban scale, it can collect the surrounding water and detain it for a period of time to reduce the rate of water volume increases in the urban's drainage system.

There are stormwater basins in the town, but some of them have issues with water pollution and overflowing. The town needs to redesign them to get the effect of reducing the pressure from stormwater among the whole town. The stormwater basin also provides the opportunity for increasing the habitats for sensitive and threatened species.

Existing stormwater basin

CVS wet pond   Walgreens Detention Pond   Holiday Inn Express - back pond

Action 1: Redesign the stormwater basin to expand capacity for higher and more frequent storm events.

1. Calculate the runoff volume for the lowest area under 100 year floods within 24 hours as the designed volume for the stormwater basin.
2. To improve the pollutant removal capacity, install pre-treatment forebay cells at the two inlets and retrofit the bottom of the pond to include multiple ponding areas of different depths. This would increase the flow path between the inlets and the outlet structure and allow for more sediment to drop out of the stormwater before leaving the pond.

Action 2: Choose native vegetation for water purification and habitat restoration from the Virginia Stormwater Management Handbook. (start from P3.05-10)

1. To reduce the water pollution, replace the turf with bio-retention-friendly plants that can survive in both wet and dry conditions or, do a complete retrofit of the basin to convert it into a bio-retention facility with layers of gravel, bio-retention soil mix, mulch, and plants.

2. During the re-design phase. consider the basin as a biological community which can attract species and develop into a complete habitat.

Objective 2: Increase the ground permeability to reduce the pressure of the drainage system and prevent soil erosion.

Kilmarnock has large areas of impermeable surfaces

RATIONALE: The efficiency of the drainage system is limited in the built environment. However, there are expansive areas in Kilmarnock producing large volumes of stormwater runoff – parking lots, paved streets and plazas. Also, the downtown area has suffered from flooding issues in many

places which threatens local properties. This is due to the largely untreated paved areas and the topography of the downtown area of Main Street, which has little topographic relief and poor drainage ability. According to the town planner, the water will come into the store fronts once every 2-3 years. Much of the town was built prior to requirements for stormwater management. To reduce and slow down the stormwater runoff, it is necessary to increase the permeable ground surfaces allowing the stormwater to run into the ground directly instead of going quickly along the impervious surfaces and rushing into the drainage system, eventually producing overflowing and flooding. The town thus far, has few areas with low impact development strategies. Central Park has permeable pavement, which is worthy to be proposed across the town.

Action 1: Construct vegetated swales at the edges of paved areas to slow down water runoff and improve water quality.

1. Choose the location which would have large runoff during the rainy days. The vegetated swale should be located at the edges of the paved areas, in Kilmarnock, such as the streets and roads along Main Street, parking lots near the commercial area, intermediary common spaces, and other open spaces.
2. Select water tolerant plant species.
3. Consider combining the vegetated swale with landscape designs intended for public use.

Action 2: Use permeable materials in certain urban impervious areas to reduce runoff volume, and promote distributed infiltration.

1) Choose a demonstration site downtown (perhaps at town hall) to apply permeable pavement. Types of permeable pavement include permeable asphalt, permeable concrete, grid block pavers, vegetated grids, Belgium block, turf block, gravel, cobbles, brick, natural stone, etc.
2) Consider applying for cost-share or demonstration grants to implement solutions on private property.

Action 3: Build rain gardens at the low points of the paved areas to separately intercept runoff and enhance aesthetic value of site.

1. The site could be the town-owned parking lot islands, edges of paved areas (roads or parking lots), adjacent to buildings, open space, median strips, swales. They will fit the character of Main Street. Also, the town should encourage this for new developments.
2. Construct rain gardens with a specialized soil mixture, an aggregate base, an underdrain, and site-appropriate plants.
3. The plant materials should tolerate both moist and dry conditions.

4.

GOAL 2: CONSERVE WATER AND REDUCE RUNOFF BY USING WATER TANKS TO COLLECT ROOF WATER FOR IRRIGATION.

RATIONALE:
Rainwater harvesting is one strategy in the greater scheme of reducing domestic water use. By harvesting rainwater we can utilize rainwater falling onto our homes and landscapes for beneficial

purposes, while preventing it from becoming stormwater pollution as it runs off into the drainage. In Kilmarnock, collected fresh water can be used for greenland irrigation. Rainwater harvesting inspires other practices that bring us into greater sustainability. Planting trees that provide summer shade to cool our homes reduces energy use. Beyond that, rainwater harvesting a local water resource, augments local water supplies, supplants potable water for non-potable purposes, reduces polluted urban runoff discharge to the receiving water body, and helps protect the reliability of a municipality's water supply. Above all, rainwater harvesting increases quality of life: ours, and that of life worldwide.

Objective 1: Harvest local water from stormwater basins adjacent to the community park and use this non-potable water for irrigation, replacing municipal potable water.

Action 1: Tap into an existing stormwater pond for irrigation, to divert stormwater and dry weather flows from the storm pond into an adjacent storage tank. From the tank, urban runoff can be delivered to the park's existing irrigation system.

Action 2: Create a stormwater harvesting and irrigation use pilot project to demonstrate water efficiency and savings over spray irrigation by installing a sub-surface irrigation system under a small test turf patch.

Objective 2: Encourage the harvesting of stored rainwater around residential areas as an extra water resource for domestic outdoor uses on the town's website.

200 gallons of storage tucked next to a garage
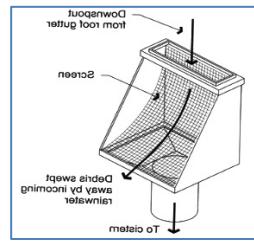

Roof water collecting detail
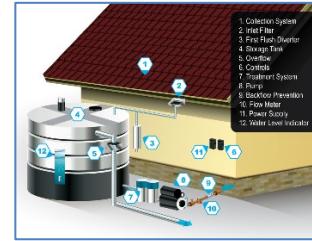
Roof water collection system

RATIONALE:

Outdoor uses include irrigation, water features, sanitary sewer flushing, street cleaning/dust control, vehicle/building washing, firefighting, recharge, and ornamental and recreational wetlands. Plumbing codes and requirements for outdoor systems may be less restrictive than those for indoor use.

Admittedly, although people in Kilmarnock do not have a current water shortage and water is relatively inexpensive in America, rainwater harvesting is also an investment in the next generation. No matter where people live, it's important to think about outdoor water conservation, especially in lawn care. A well-managed yard not only uses less water, it can also significantly cut down on downstream water pollution from using too much fertilizer and pesticides.
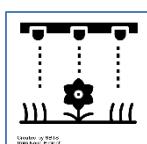
 Irrigation **Carwash** **Firefighting** **Water features**
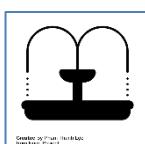
Action 1: The roof rainwater catchment system should be demonstrated at several locations.

> 1. **Gutters**: Roof water gathers in the gutters and runs to a pipe towards the tank.

> 2. **First Flush**": The first rain of the year is the dirtiest as it cleans the roof. This water is directed away from the tank in a "first flush system" and the subsequent water continues to the tank.

> 3. **Screen**: The rainwater goes through a screen to remove leaves and debris, and then funnels into the top of the covered tank.

> 4. **Storage**: The tank is dark, to prevent algae from growing, and screened, to prevent mosquitoes from entering

Action 2: Irrigation system (A hose attachment is located near the bottom for irrigation. Larger systems can include gravity drip irrigation, or a pump for drip irrigation)

Action 3: Vehicle/building washing (Demand for outdoor washing may be seasonal in cold climates. Water harvested for washing may require disinfection due to risk of exposure)

Action 4: Community firefighting (Considerations for fire suppression sprinkler systems are similar to those for firefighting)

MAPS

MAP 1: STUDY AREAS SUBWATERSHEDS AND KILMARNOCK TOWN LIMITS

(Kilmarnock Watershed Assessment Report)
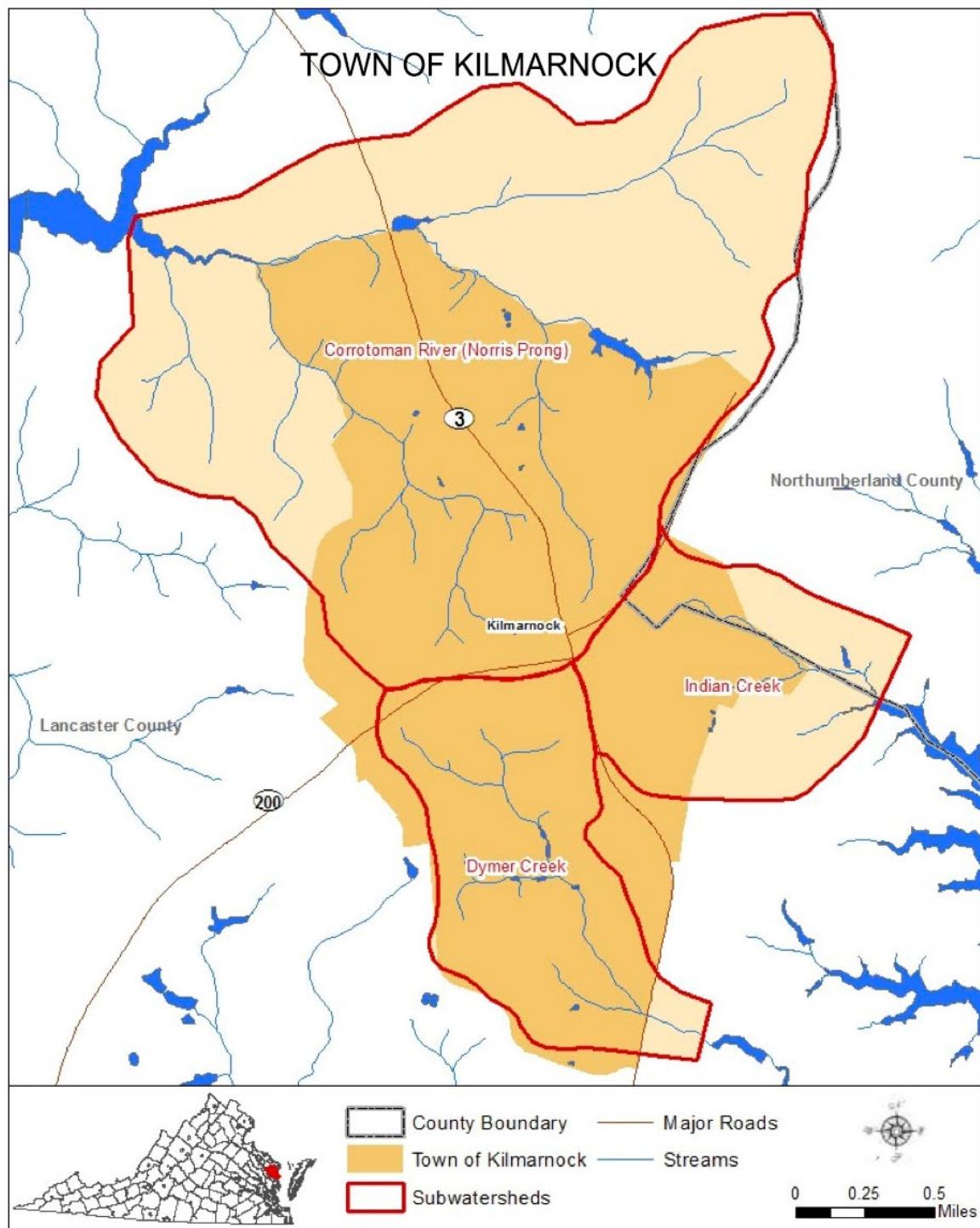
(Comprehensive Plan: Town of Kilmarnock)

TOWN OF KILMARNOCK

N Main Street

E Church Steet

Irvington Rd

S Main Street

Impervious Percentage=15.77%

Legend

Boundary of Kilmarnock

Road

Kilm LandCover
Feature

Wetland

Water

Tree Canopy

Pervious Surface

Impervious Surface

Bare Land

1,800   900   0   1,800 Feet
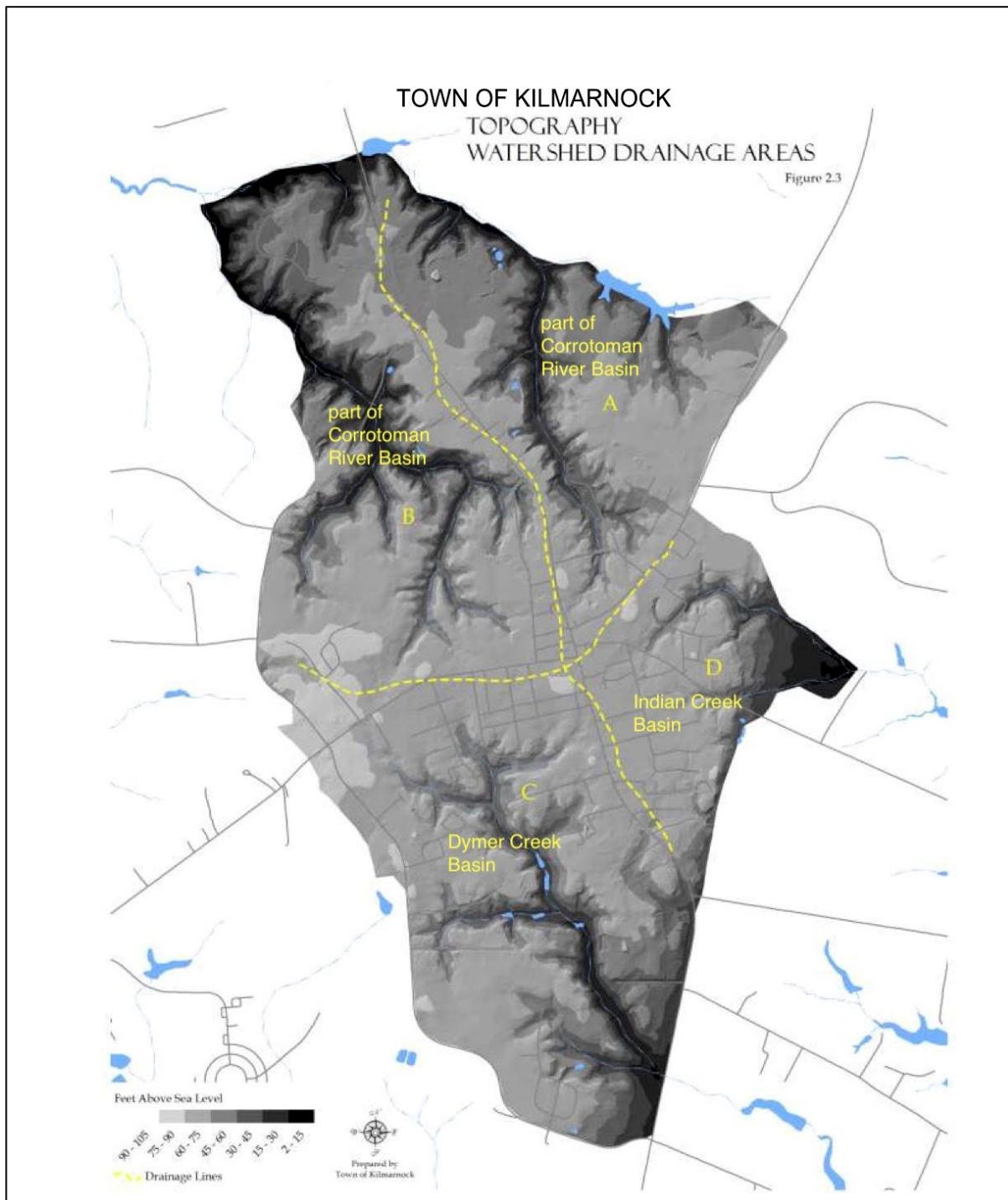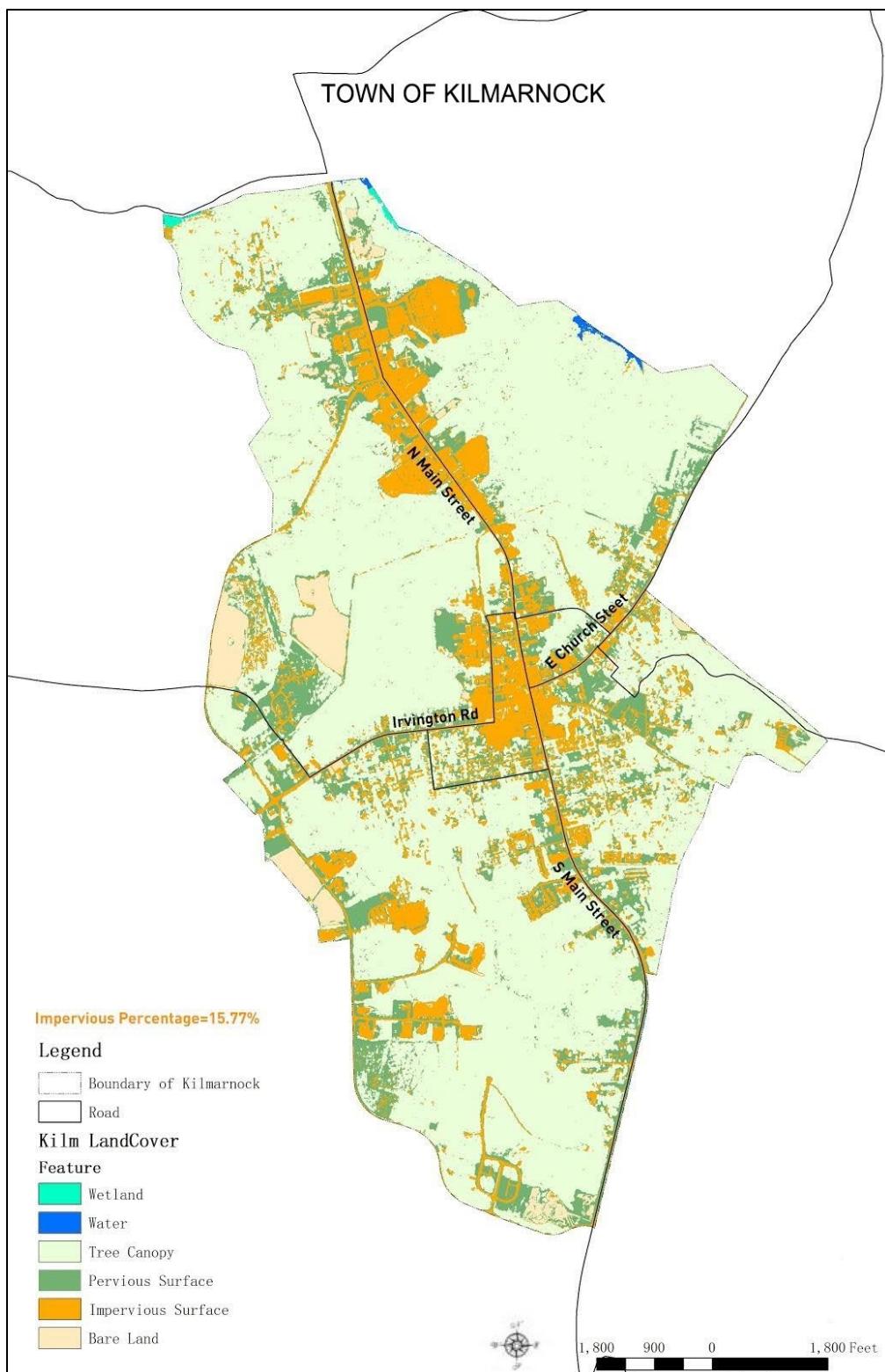
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https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_017822.pdf

Virginia Stormwater Management Handbook. Virginia Department of Conservation and Recreation. *Native Plant Guide for Stormwater Management Areas in the Mid-Atlantic, USA Trees and Shrubs*

https://www.deq.virginia.gov/Portals/0/DEQ/Water/Publications/HndbkVolumeI.pdf

Town of Kilmarnock. 2013. *Kilmarnock Watershed Assessment Report*

RESOURCES

Low Impact Development Technologies: https://www.wbdg.org/resources/low-impact-development-technologies#:~:text=A.,water%20where%20it%20is%20generated

Minnesota Stormwater Manual: STORMWATER AND RAINWATER HARVEST AND USE/REUSE COMBINED

Stormwater Management: Rainwater Harvesting in Residential-Scale Landscapes

APPENDIXES

APPENDIX A: PRE-TREATMENT FOREBAY CELL TO IMPROVE THE POLLUTANT REMOVAL CAPACITY
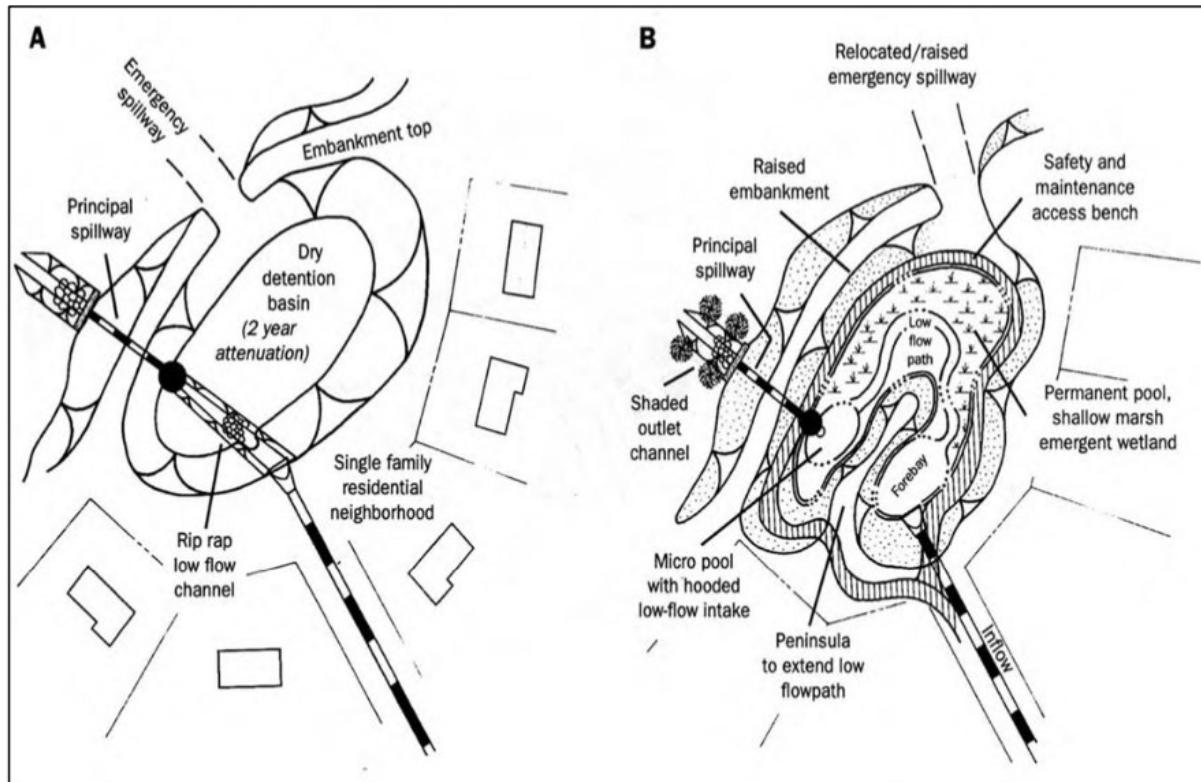
Native Plant Guide for Stormwater Management Areas in the Mid-Atlantic, USA
Trees and Shrubs

Tree/Shrub	*Zone	Form	Available	Inundation Tolerance	Wildlife Value	Notes
American Beech (Fagus grandifolia)	5,6	Dec. Tree	no	no	High, mammals and birds.	Prefers shade and rich, well-drained soils.
American Holly (Ilex opaca)	5,6	Dec. Tree	yes	some	High, songbirds, food, cover, nesting.	Coastal plain only. Prefers shade and rich soils.
American Hornbeam (Carpinus caroliniana)	4,5	Dec. Tree	yes	yes	Moderate, food, browsing.	Most common in flood plains and bottom land of Piedmont and mountains.
Arrowwood Viburnum (Viburnum dentatum)	2,3,4	Dec. Shrub	yes	no	High, songbirds and mammals.	Grows best in sun to partial shade.
Bald Cypress (Taxodium distichum)	3,4	Dec. Tree	yes	yes	Little food value but good perching site for waterfowl.	Forested Coastal Plain wetlands. North of normal range. Tolerates drought.
Bayberry (Myricia pensylvanica)	4,5,6	Dec. Shrub	yes	no	High, nesting, food cover. Berries last into winter.	Coastal Plain only. Roots fix N. Tolerates slightly acidic soil.
Bitternut Hickory (Carya cordiformis)	3,4,5	Dec. Tree	no	yes	High, food.	Moist soils or wet bottom land areas.
Black Cherry (Prunus serotina)	5,6	Dec. Tree	yes	yes	High, fruit is eaten by many birds.	Temporarily flooded forested areas. Possible fungus infestation.
Black Walnut (Juglans nigra)	5,6	Dec. Tree	yes	yes	High, food.	Temporarily flooded wetlands along flood plains. Well drained, rich soils.
Blackgum or Sourgum (Nyssa sylvatica)	4,5,6	Dec. Tree	yes	yes	High, songbirds, egrets, herons, raccoons, owls.	Can be difficult to transplant. Prefers sun to partial shade.
Black Willow (Salix nigra)	3,4,5	Dec. Tree	yes	yes	High, browsing and cavity nesters.	Rapid growth, stabilizes stream banks. Full sun.
Buttonbush (Cephalanthus occidentalis)	2,3,4,5	Dec. Shrub	yes	yes	High, ducks and shorebirds. Seeds, nectar and nesting.	Full sun to partial shade. Will grow in dry areas.
Chestnut Oak (Quercus prinus)	5,6	Dec. Tree	no	no	High. Cover, browse and food.	Gypsy moth target. Dry soils.
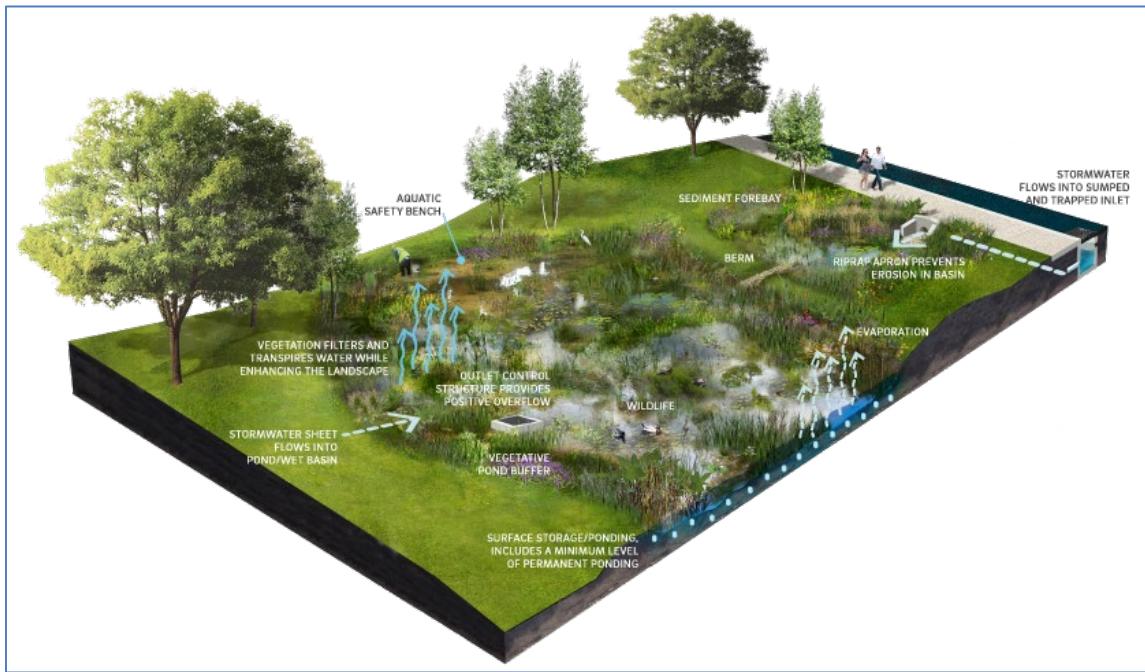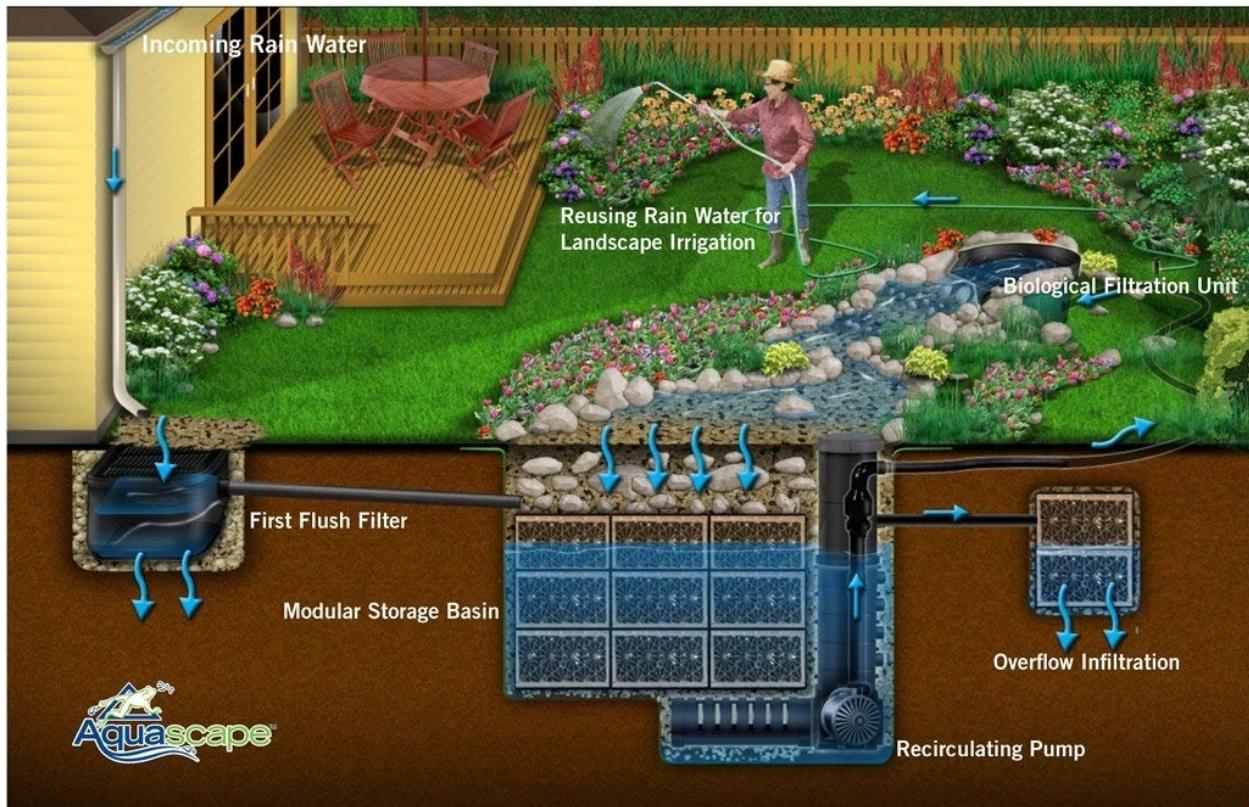
RECREATION AND CULTURE: RECOMMENDED POLICIES AND STRATEGIES

Written by Pin Hui Wang, Jiajing Lyu

RATIONALE:

Throughout the history of Kilmarnock as "The Crossroads," the development of the whole town has an indispensable relationship with commerce. Agriculture, forestry and fisheries play important roles in the local economy. Numerous historical buildings and cultural resources throughout Kilmarnock are the physical records of past stories. To provide a better understanding of how Kilmarnock was established, for both residents and visitors, it is beneficial to establish a guiding sign system to emphasize, reveal, and celebrate the small-town charm and friendly merchants.

Kilmarnock is also a town which is attracting more and more retirees to move in. According to the U.S. Census Bureau, from 2007- 2011, the average median age of Kilmarnock's population was 54, however the percentage of the population over age over 60 has already reached 41 percent and that percentage is likely to grow. From page 8-11 in Chapter one of the Comprehensive Plan, the population of Kilmarnock is displayed as a linear regression model which predicts that the population will increase to 1,600-1,700 by 2020.

Besides, the report of Business & Service Establishments in Kilmarnock shows that the number one service is health care, while the existing parks in the town only cover a small part of the town and lack programs designed for elderly residents. To address this issue, existing services and facilities oriented to those age groups should be expanded into community and public space. Specifically, the planning strategies of recreation areas need to take the needs of older people into consideration by providing more parks that can be accessed by pedestrians.

More local parks with high degree of walkability and accessibility are necessary for older residents who want to take a walk near to where they live. In fact, walkable and accessible recreation areas, parks and open spaces could generate economic benefit to property owners, local governments and businesses by expanding higher tax assessments and property values (Shoup and Ewing 2010). The recommendation of proposed corridor design guidelines for these spaces enables Kilmarnock to become a place that not only celebrates cultural and charming town atmosphere, but welcomes the future changes of population and income growth.

BACKGROUND STATISTICS:

The World Health Organization lists the general characteristics of "Age-Friendly" cities should include housing, transportation, social participation, community support and health services, communication and information, social participation, civic participation and employment, and outdoor spaces and buildings, which include parks and open spaces. (https://www.who.int/ageing/publications/Age_friendly_cities_checklist.pdf)

" An assessment from the Trust for Public Lands found that playgrounds, tennis court and ball grounds accounted for over 60 percent of city park facilities in the U.S., which reflects a bias toward the young." (Why communities should be designing parks for older adults, Jay Maddock, March 15, 2017)

"Older people benefit from engagement with outdoor environments in three main ways: participation in outdoor physical activity, better mental health and function, and social interaction with others." (The Benefits of Nearby Nature in Cities for Older Adults, f written by Kathleen Wolf, PHD and Elizabeth Housley, M.A.)

 "More and more studies show that elderly people need exercise, social connection and nature. Senior parks are a really low-cost investment that hit each of these three aspects.", said by Jay Maddock, the professor of public health at Texas A&M University.

Objective 1A is focused on creating a guiding signage system with unified style to strengthen visitor familiarity with tourism spots and historical areas. Objective 1B takes a close look at the public art project "Watermen's Way" within Kilmarnock and the surrounding towns (see pictures A and B below), which aims to honor those work of fiberglass boots at seafood industries of Chesapeake Bay and illustrates the themes of crabs, fish and oysters from Bay, rivers, and creeks. Better signage can help visitors locate attractions and stay longer.

Objective 1A*: Propose a system of guiding signs which combines with the existing sign features (see pictures below) for the visitors to experience cultural areas in Kilmarnock such as Downtown streets and the museum, as well as especially significant historical places along the main roads.

> **Action 1:** Identify existing historical and cultural areas (Appendix A). Submit to the Virginia Department of Historic Resources (DHR) to have a preliminary evaluation of these resources.

> **Action 2:** Create an interpretative signage system guideline for all the town's signage with a unified style.

A   B

> **Action 3:** On the main sidewalk, place several signs with a guide map indicating culturally relevant areas for tourists to visit.

> **Action 4***: Put a welcome sign on the entrance of the historical and cultural related areas (suggested areas: Kilmarnock Museum, Grace Episcopal Church, Norris Pond, Virginia State Route 3 approaching Kilmarnock).

Above, signage on the main street could also be expanded to have historic descriptions of the "Steptoe District."

At left, visitors will stay longer with more guidance on places to visit.

Action 5: Identify local tourist spots on current discovery maps (see the map on the right), and set up a wayfinding signage system for visitors to make these places more accessible and easily find their traveling destination.

Objective 1B: Promote the features of Watermen's Way (public art project) and improve current publicity to the visitors by implementing interactive games and connecting related fishery industries.

Action 1: Identify current sponsors of the project and strengthen the existing collaboration by amplifying the power of respective businesses.

Action 2: Create brochures, posters regarding the origin of fiberglass boats, and then design stamp collection games with "passport" (introduce town history, stores, hot spots) and hint maps and prepare corresponding rewards based on the numbers of stamps collected. [1]

Action 3: Expand the cooperation with local shops and restaurants by setting up those publicity materials on these spaces as well as parking lots, downtown streets and parks where most visitors would visit or stop at.

Virginia River Realm 50 years Discovery Map
Shows things to do around (but mostly not in) the town

Action 4: Connect the content of rewards to the products of fishery industries or coupons of sponsoring shops and restaurants to benefit the local economy.

RESPONSIBLE PARTIES:

1)The Administrative Department of Kilmarnock (Responsible for public works)

2)Placement of Signage

3)Signage check-in for damage and cleaning needs

4)Kilmarnock Museum (Establish Visitor Center and Walking Tour)

5)Virginia River Realm.com

6)Rappahannock Art League (Founded in 1949 including 400 members. Our Studio Gallery on Main Street)

7)Steamboat Era Museum

8)Lancaster by the Bay Chamber of Commerce (Supports economic to enhance local businesses)

COST: Cost sharing for historic resource studies is available through VA Department of Historic Resources. Signage can be funded through tourism grants and existing lodging and restaurant taxes. The Virginia Tourism Bureau also has tourism development funds available.

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[1] https://www.facebook.com/mongaB2/posts/1912215975751366/

For **Objective 1A** the average cost of the planning & design part is about $50,000. The price range of fabrication & Implementation is large based on the level of types of signage and level of customization. See more information of manufacturer example: https://guidestudio.com/budgeting-signage-wayfinding/

For **Objective 1B the** sponsors are mainly still the same. The primary expenditure will be on the printing price of the brochure, posters, passports, stamps and the rewards from local stores. The price varies based on the number of copies needed. The increased visitation in stores should result in additional sales tax revenue for the town.

GOAL 2: EXPAND ACCESS TO WALKABLE RECREATION AMENITIES, ESPECIALLY FOR ELDERLY RESIDENTS.

To create an aging-in-place-friendly town, the most important thing is to provide more accessible activity spaces which are designed for elderly people. This goal focuses on providing more recreation places fit with the needs of residents.

Objective 1 is specifically focused on building more community(pocket) parks within acceptable walking distance less than 0.5 miles for elder people.
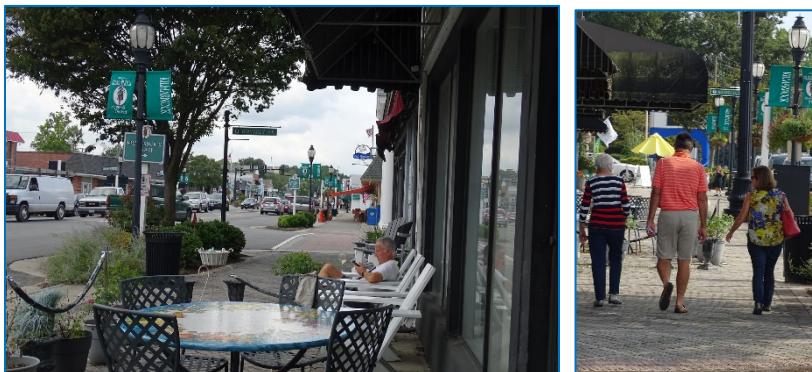
Older residents and visitor enjoying Kilmarnock's streets (top). At right, elements of an ag-friendly city. Credit: World health organization, 2007
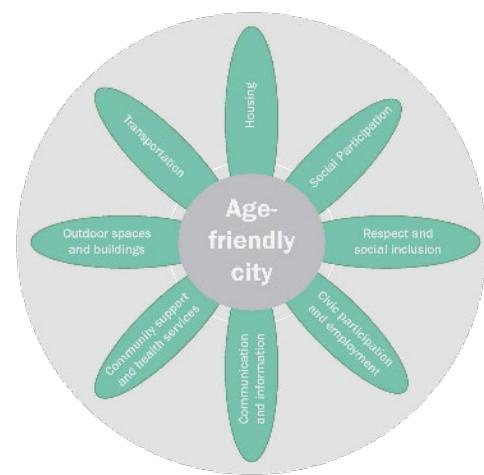
Objective 1: Improve the accessibility of the surrounding public spaces for local residents by adding the pocket parks. Create a series of ¼ acre parks nearby communities.

> **Action 1:** Propose vacant areas which could be transferred to the pocket park (See Map 3.4)
>
> **Action 2:** Put forward design guidelines and standards for pocket parks, recreation areas, programs and green coverage, etc. (See Appendix B)
>
> **Action 3:** Select one or two areas as the demonstration sites for pocket parks. (See Map 5)
>
> **Action 4:** Establish a Park Stewards Group to help with park care and management such as the tending of a garden bed, invasive species removal and trash pickup from landscape.
>
> **Action 5:** Use the pedestrian plan to improve pedestrian access to parks. Create connections between parks and surrounding neighborhoods and existing parks. (See Map 6)

1) National Recreation and Park Association.

2) The Trust for Public Land is one organization that offers assistance with private and public funding for mini-parks (Trust for Public Land, 2009)

3) The government departments like Social services or Community Development to raise funding to build these parks. Establish the Park Stewards Program helping to maintain these parks.

COST:

For the pocket parks, the cost of these parks will depend on several things including the land value, the programs provided, the plants species selected, and more. Baltimore spent an average of $117,000 on a pocket park. Costs in Kilmarnock could be much lower.

ENTRANCE CORRIDORS

RATIONALE:

The purpose of entrance corridor design guidelines is to provide a tool for property owners, developers, designers to create, review and build quality new buildings or renovate existing structures along a town's major entrance corridors. Many town corridors lack a defined beginning and end which makes drivers unclear whether they actually arrived in the towns or not. The appearance of the buildings or street view are chaotic due to lack of corridor design guidelines. Unsightly or oversized signage can actually discourage visitors and future businesses. Entrance corridor standards can ensure more attractive impressions and increase property value.

In the Comprehensive Plan, the town states the importance of protecting the delicate balance and land use compatibility between existing/future development with the natural environment and the community's historic resources. As part of planning for the future, the Town's goal is to preserve the past by maintaining and enhancing Kilmarnock's charm as a small town. One way to retain a viable sense of community with a small-town appeal, while enhancing the town's economic base by attracting consumers, is to identify and preserve existing historic structures, especially those located in the downtown commercial district and to ensure signage and facades are in keeping with town character.

Forty percent of land in town is vacant. With the increase of population, there will be more lands that will be developed. So for the future long-term development of the small town, it is quite important to put forward an entry corridor design standards to keep the town's character intact.

BACKGROUND STATISTICS:

"Distinct palettes of recommended landscape materials are defined for different site characteristics within the entry corridors (e.g. low-land/riparian vs. steep slopes) to ensure the practicality and long-term viability of the concept." (example goal from City of Steamboat Springs, Urban Design Standards & Entry Corridor Concepts)

Objective 3 : Put forward entrance corridor design standards.

Action 1: Develop a list of desirable standards (signage, facades, massing etc.) Consider forming a local committee to develop or hire a consultant to assist.

Action 2: Update planting design standards for landscaping in entry corridors (See Forestry section).

Action 3: Propose standard to the Planning Commission and Town Council (note that once adopted, the Commission can also serve as the review body for the standards).

Action 4: Consider updates to sidewalks/ pedestrian/ trail design standards. (See Appendix C)

RESPONSIBLE PARTIES:

1) Town of Kilmarnock: Town Manager & Public Utilities, Community Development, Planning & Zoning
2) The town could cooperate with Virginia Department of Transportation on streetscape guidelines

Cost:

Objective 3 will require the staff's time for research, investigation and code writing of the guideline. There are several links that could be the reference for corridor design guidelines. Many examples of town standards for entries are available on line.

https://co-steamboatsprings.civicplus.com/DocumentCenter/View/1703/steamboat_urban_design_stds_adopt21908rev?bidId=
https://www.charlottesville.gov/DocumentCenter/View/466/Entrance-Corridor-Design-Guidelines-PDF

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Kathleen L. Wolf, PH.D., "Nature's Riches: The Health and Financial Benefits of Nearby Nature", Accessed 2016.

https://www.naturewithin.info/New/2016.11.Economic_Benefits_of_Nature_in_Cities.KWolf.pdf

Kathleen L. Wolf, PH.D., The Importance of Nature in Older Populations, Accessed August 2, 2016. https://naturesacred.org/nature-seniors/

National Recreation and Park Association, " Creating Mini- Parks For Increased Physical Activity".

https://www.nrpa.org/contentassets/f768428a39aa4035ae55b2aaff372617/pocket-parks.pdf

Shoup, Lilly, and Reid Ewing. "The economic benefits of open space, recreation facilities and walkable community design." *A Research Synthesis. Princeton, NJ, Active Living Research, a National Program of the Robert Wood Johnson Foundation* (2010).

Vittoria Traverso, Cities around the world are adopting a long-standing feature of Chinese public parks to boost exercise among pensioners, Accessed October 2019.

https://www.bbc.com/worklife/article/20191028-the-cities-designing-playgrounds-for-the-elderly

Winston Churchill Memorial Trust Travelling Fellowship 2007 ,Alan Brown, Engaging Older People in Parks and Green Spaces, Accessed 2017.

https://www.wcmt.org.uk/sites/default/files/migrated-reports/195_1.pdf

World Health Organization, Checklist of Essential Features of Age-friendly Cities, Accessed 2017.

https://www.who.int/ageing/publications/Age_friendly_cities_checklist.pdf

UCLA Complete Streets Initiative Luskin School of Public Affairs Lewis Center for Regional Policy Studies , " Placemaking For An Aging Population", Accessed June 2014.

https://www.lewis.ucla.edu/wp-content/uploads/sites/2/2015/04/Seniors-and-Parks-8-28-Print_reduced.pdf

RESOURCES

WEB LINKS

Albemarle County Entrance Corridor Design Guidelines

https://www.albemarle.org/government/community-development/planning-codes/entrance-corridor-design-guidelines

Artisans Center of Virginia

http://www.artisanscenterofvirginia.org/index.php/home/profile/rappahannock-art-league

Blog: Small Town Girls: A Weekend of Shopping in Kilmarnock

https://www.virginiasriverrealm.com/small-town-girls-weekend-shopping-kilmarnock/

Budgeting for Signage & Wayfinding

https://guidestudio.com/budgeting-signage-wayfinding/

Chesapeake Bay, VA Guide Map

https://discoverymap.com/chesapeake-bay-va

Driving Tours of Northern Necks

https://www.northernneck.org/driving-tours/

Website of Watermen's Way Art Project

https://www.virginiasriverrealm.com/boots#

Vest Pocket Parks (PAS Report 229)

https://www.planning.org/pas/reports/report229/

FUNDING

OPPORTUNITIES FOR CULTURAL AND RECREATION

1) **Virginia Tourism Corporation** (VTC): Marketing Leverage Program

   https://www.vatc.org/grants/

2) **Virginia Tourism Corporation (VTC):** DMO Wander Love Recovery Grant Program

   https://www.vatc.org/coronavirus/brand-response-marketing/campaign-wanderlove/

3) **Virginia Department of Historic Resource**s:

https://www.dhr.virginia.gov/press_releases/cost-share-and-planning-grant-awards-for-2019-2020/

Maps

Map 1: Existing Historical Areas

This map shows the existing historical and cultural areas
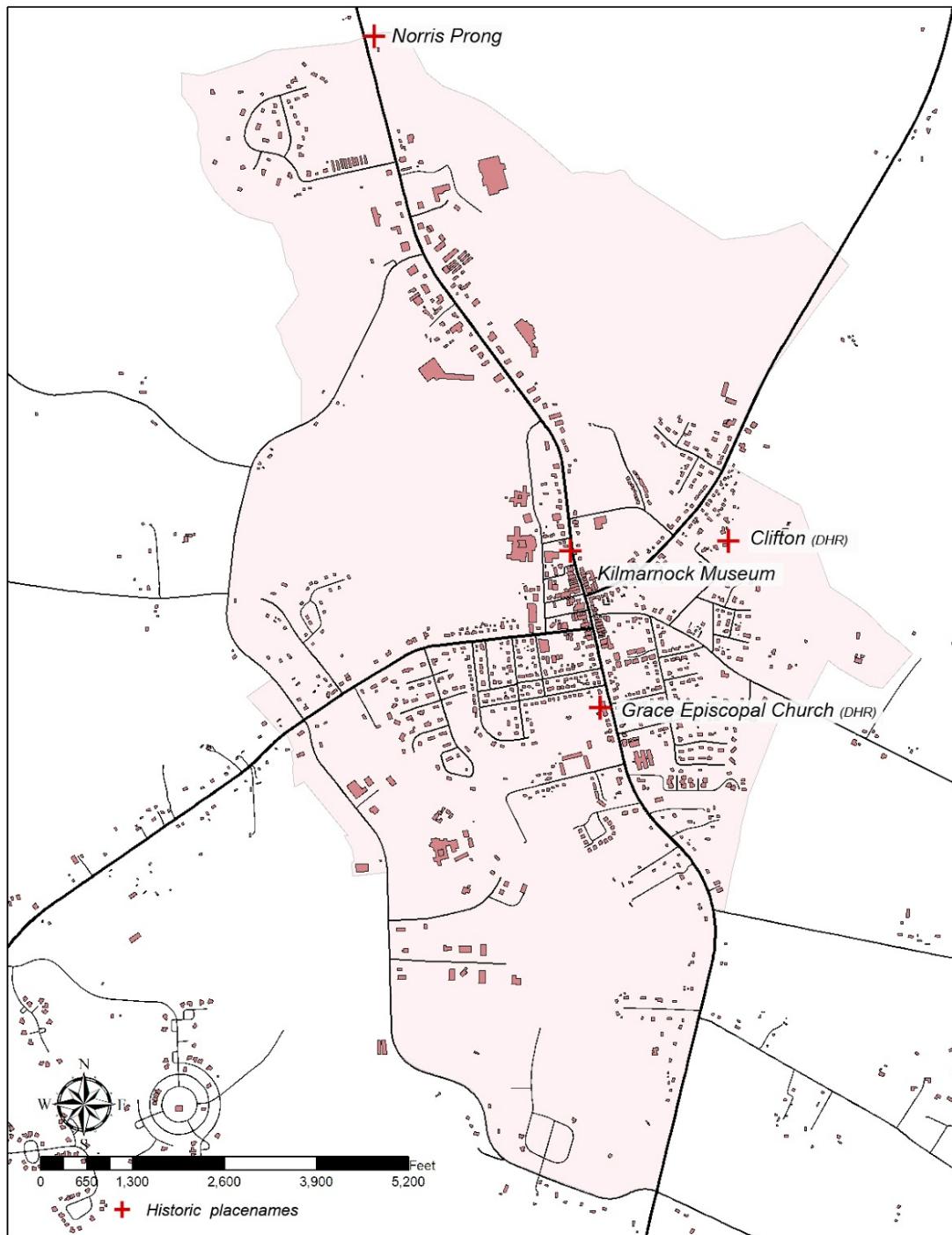
This map shows the location of fiberglass boots by watermen's way public art project


LOCATION OF FIBERGLASS BOOTS
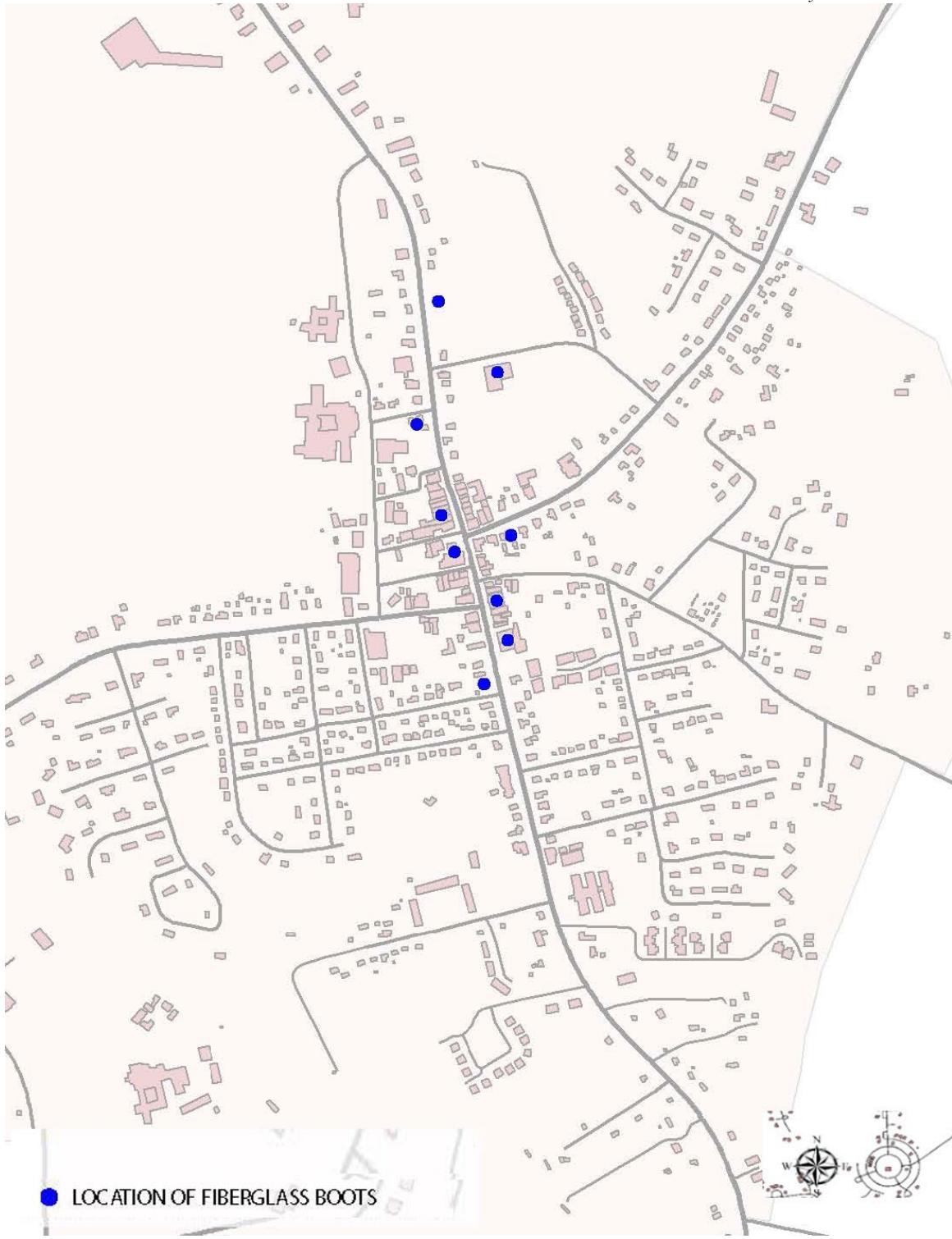
MAP 3: EXISTING PARK SERVICE AREAS

THIS MAP SHOWS THE EXISTING PARKS SERVICES AREAS AND THE 5 MINUTES, 10 MINUTES AND 15 MINUTES WALKING DISTANCE.


Only arrived by car

5 MINS   10 MINS   20 MINS

1 Baylor Park Nature Trail

2 Kilmarnock Town Centre Park

3 Joe Curry Memorial Park

N
W   E
S

Feet
0   650   1,300   2,600   3,900   5,200
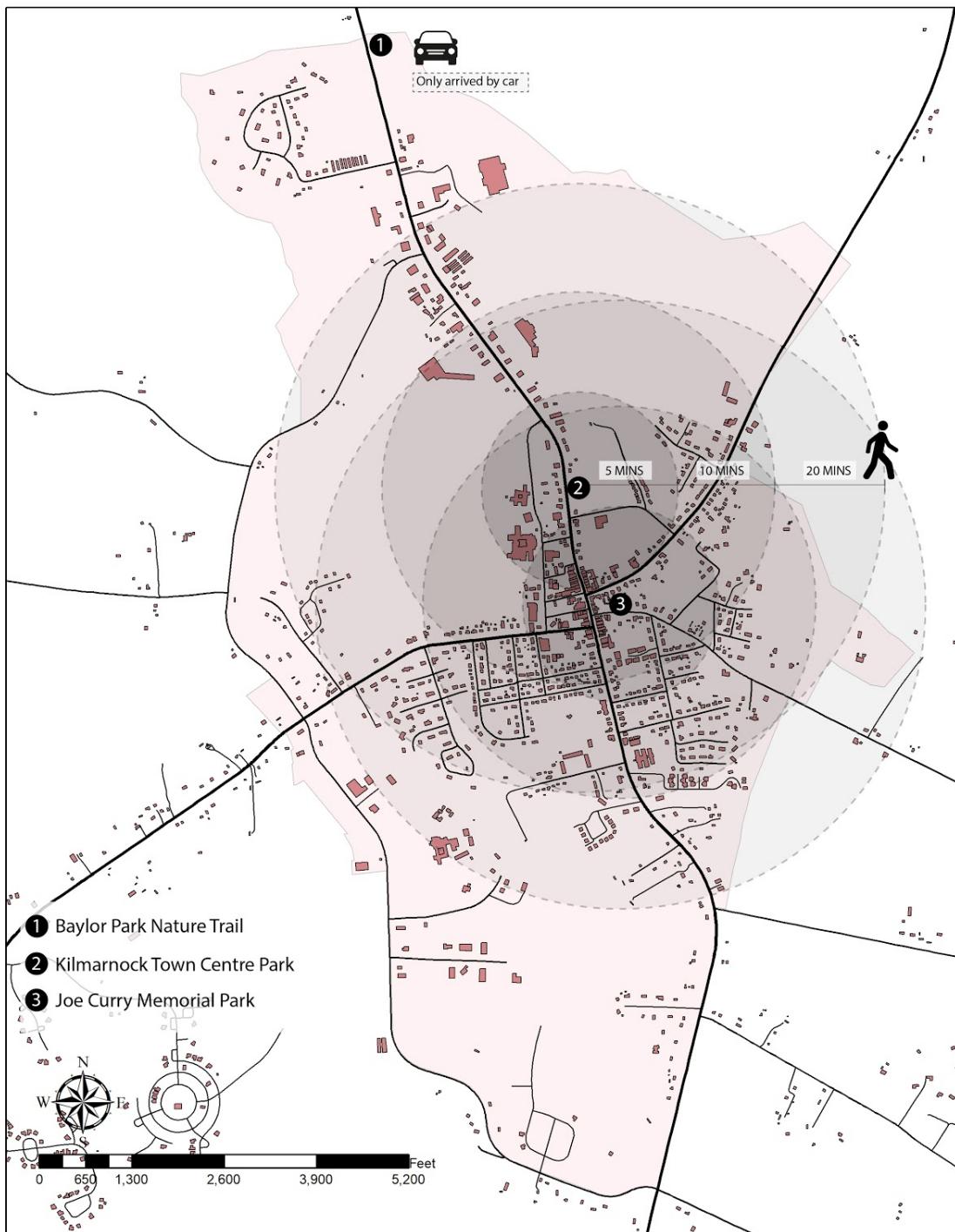
BARE AREAS

EXISTING BUILDLINGS
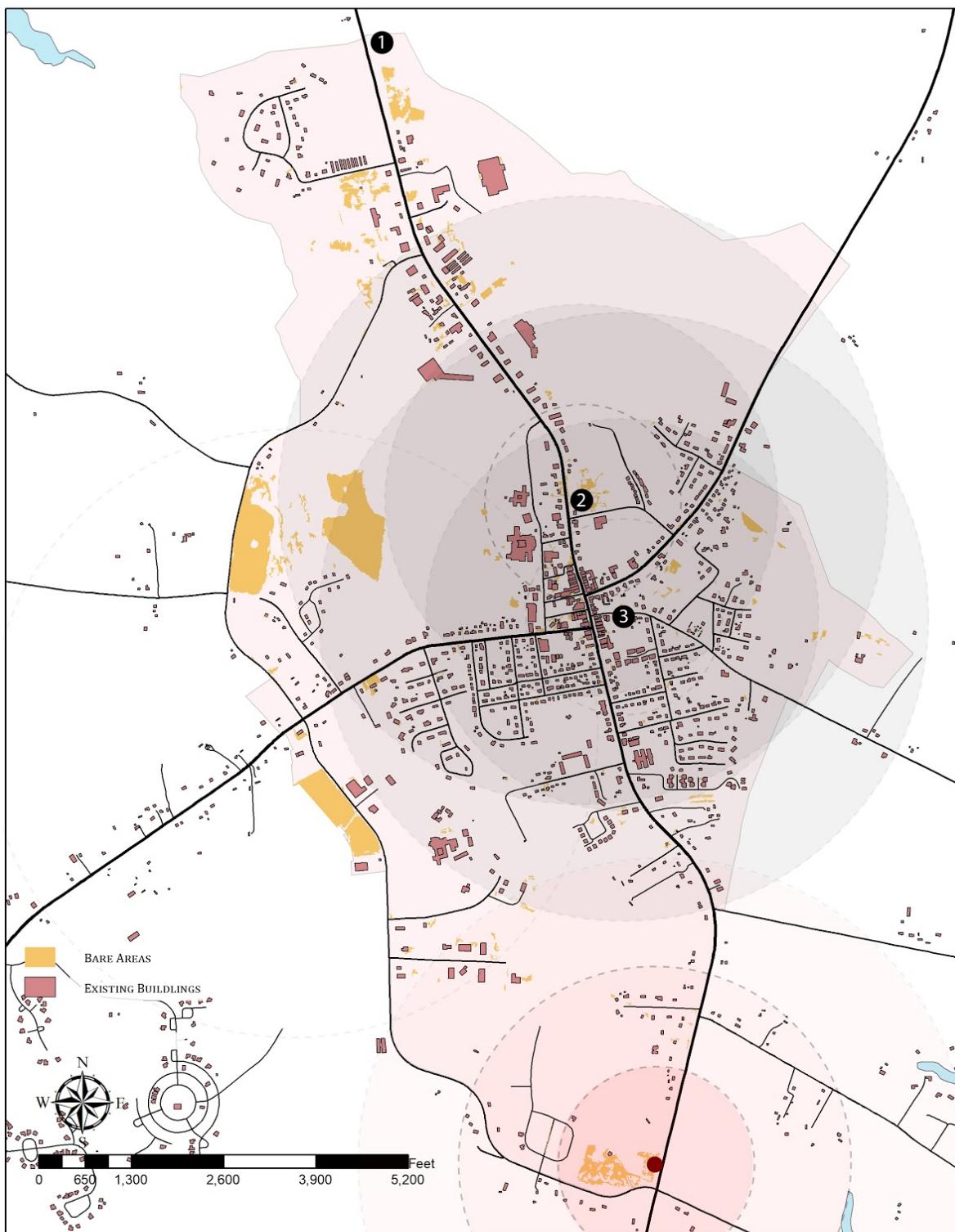
THESE YELLOW AREAS SHOW THE BARE AREAS WHICH COULD BE TAKEN INTO CONSIDERATION.

THIS MAP FEATURES THE HABITAT CORES IN RELATIONSHIP TO HUMAN DEVELOPMENT. THE FOUR ECO-URBAN ZONES SHOW HOW THE NATIVE ECOLOGY AND HABITAT CORES CAN BE CONSERVED THROUGH GREEN INFRASTRUCTURE PLANNING.

54
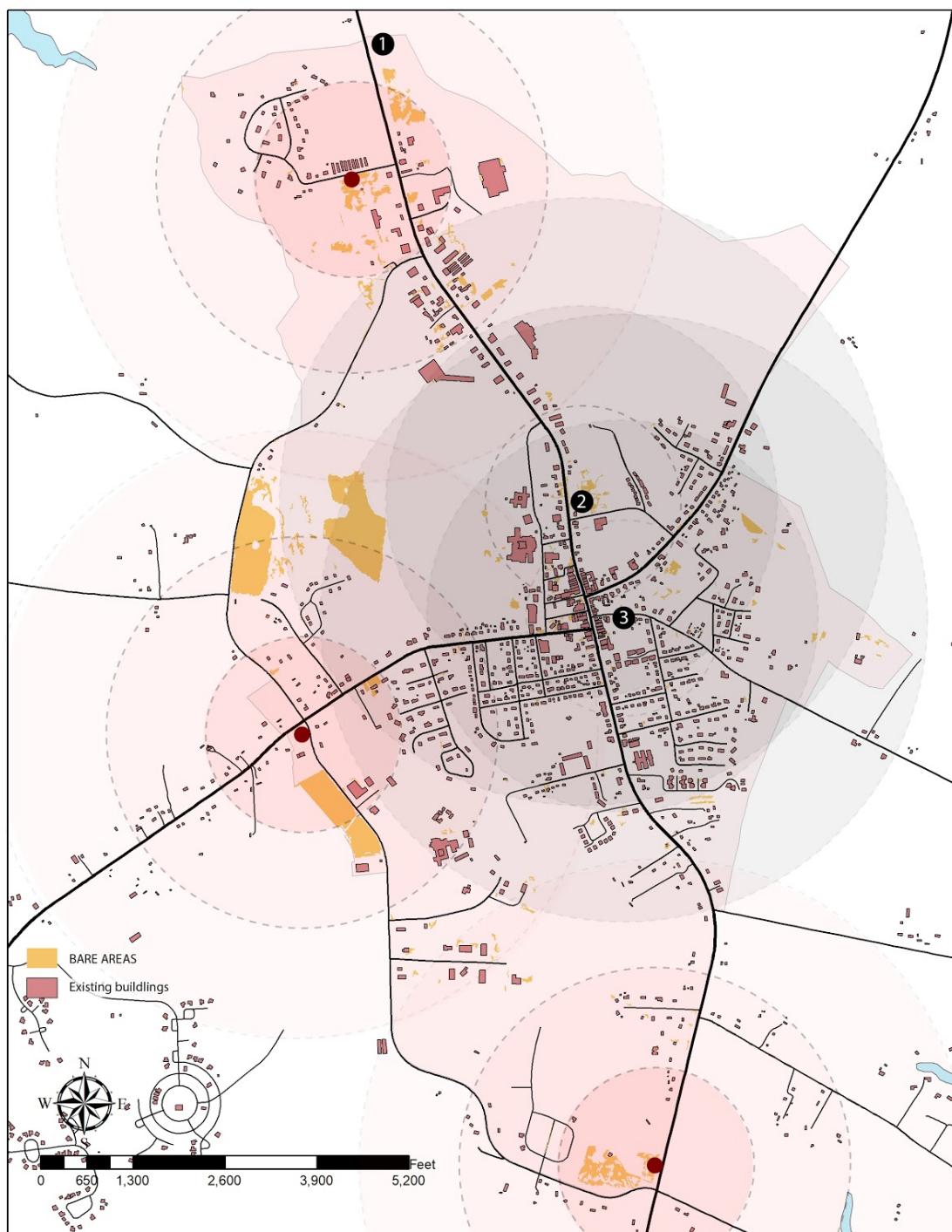
Map 6: Proposed Pedestrian Connections

Legend:
- Proposed Pedestrians Connection
- Bare Areas
- Existing Buildlings
- Proposed Poket

N W E S

0   650   1,300   2,600   3,900   5,200   Feet
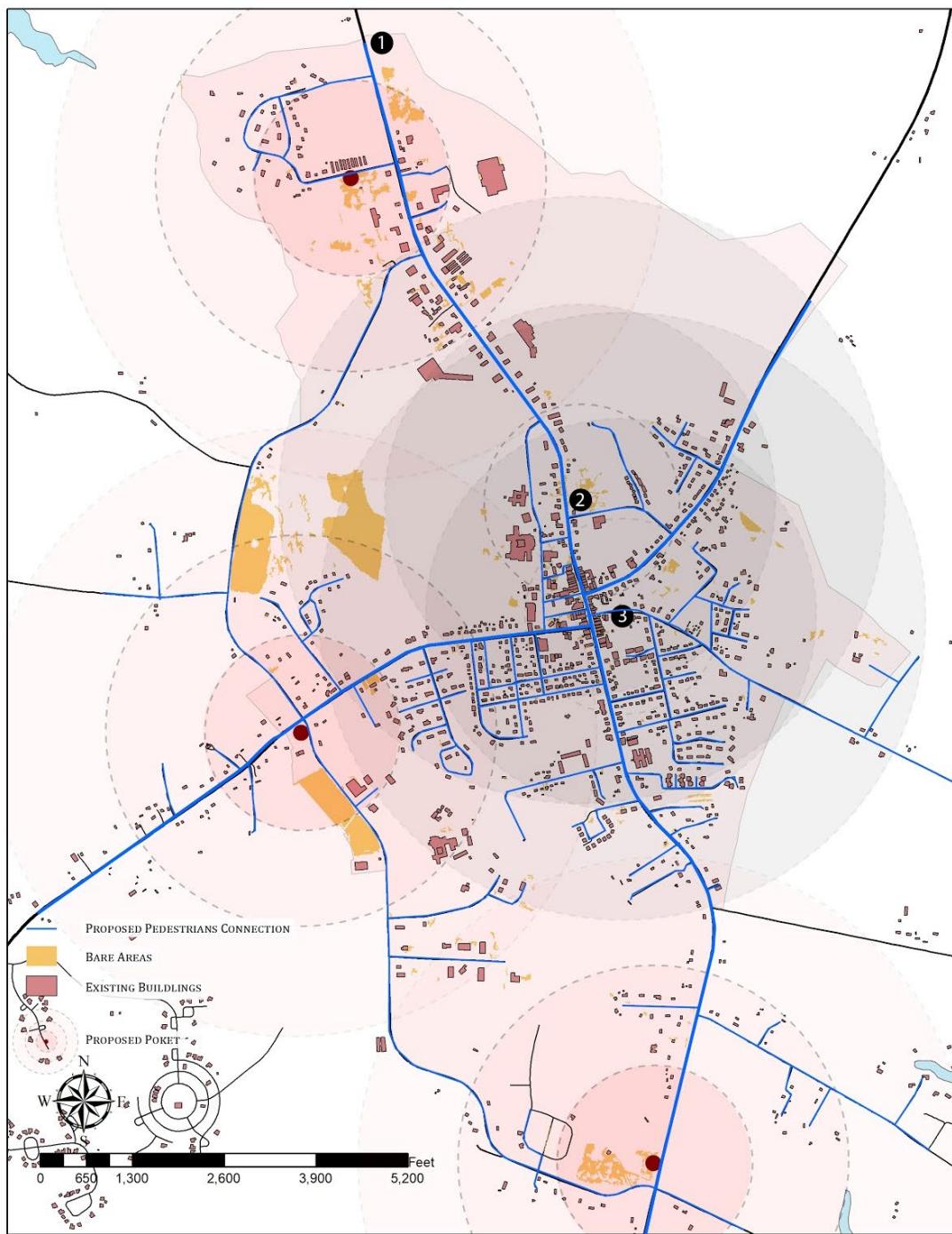
Appendixes

Appendix A: Budgeting for Signage & Wayfinding (Example Only)

(FROM Guide Studio, Link:
https://www.dhr.virginia.gov/wpcontent/uploads/2018/06/SurveyManual_2017.pdf

Tier 1
Planning & Design: $20,000–$45,000
Fabrication & Implementation: $75,000–$200,000
Simpler in design and size, these projects often enhance the existing elements of a wayfinding or signage program instead of starting from scratch, and typically do not include large or elaborate gateway elements. Sign designs that leverage flat graphics and simple shapes are cost effective, using single sheets of aluminum in fabrication. Also, signs may be attached to existing poles or structures and any new elements would be added to existing signage or posts.

Tier 1
*Examples shown are
from the Tremont and
Ohio City neighborhoods
in Cleveland, Ohio.*
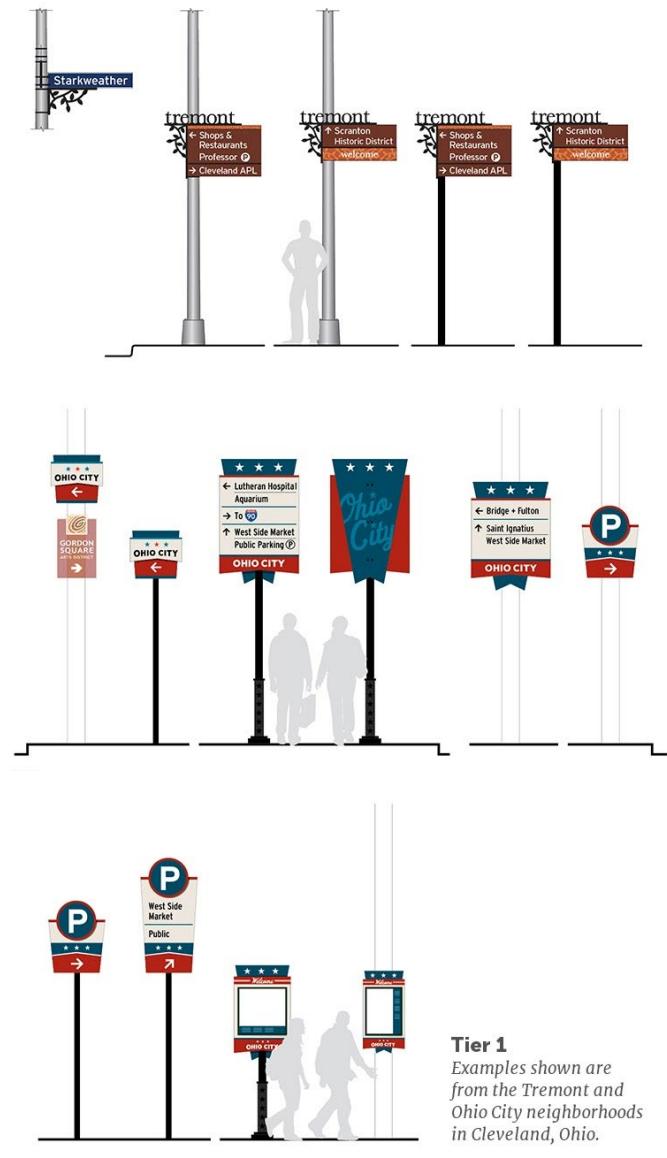
Tier 2

Planning & Design: $45,000–$65,000
Fabrication & Implementation: $200,000–$300,000

While the journey is always a priority no matter the budget, Tier 2 allows for more customization. Decorative posts or fabricated panels that are layered and dimensional allow for a more intricate and higher quality aesthetic within the destination. Custom shapes and cuts, and light use of masonry or stonework add to the character and the quality (as well as the cost).

Tier 2
Examples shown are from the City of Kent and the City of Worthington.

Tier 3
Planning & Design: $70,000–$95,000
Fabrication & Implementation: $300,000–$500,000
In addition to being larger in scope and complexity, these projects often include a higher level of customization, including elaborate shapes, complex designs and unique materials that appeal to a higher aesthetic. Illuminating signs or adding electrical components, heavy use of masonry or stonework, and large gateway elements beautify the space and create an eye-catching wayfinding program.

Tier 3
Examples shown are from the City of Sandusky and the City of North Olmsted.

Considerations/Variables
No matter the size of the wayfinding project, there are always considerations and variables that impact the scope and budget.

- **Material selection:** Most exterior signs are built from aluminum, but other higher end materials can be used if the design intent or brand aesthetic calls for it.
- **Material usage:** Typically the larger amount of material used equals a better cost per unit, essentially buying in bulk and cutting down on waste.
- **Size and scale of signage:** The size and complexity of signs implemented in a project directly affect the fabrication and installation cost.

(See more details on the website)

APPENDIX B: THE DESIGN GUIDELINES FOR SENIOR- FRIENDLY PARKS

FROM PLACEMAKING FOR AN AGING POPULATION REPORT, Link: https://www.lewis.ucla.edu/wp-content/uploads/sites/2/2015/04/Seniors-and-Parks-8-28-Print_reduced.pdf

Ten purposes or outcomes that senior-friendly open spaces should strive to satisfy

- Control
- Choice
- Safety and security
- Accessibility
- Social support
- Physical Activity
- Privacy
- Contact with nature
- Comfort
- Aesthetic and sensory delight

(For more details for each purpose see in the pdf)

APPENDIX C: KILMARNOCK, STREET DESIGN STANDARD

Town Entrance Road

Existing condition Main Street

Current:

Improved: