



Town of Carrboro

Town Hall
301 W. Main St.
Carrboro, NC 27510

Meeting Agenda Board of Aldermen



Tuesday, November 10, 2015

7:30 PM

Board Chambers - Room 110

A. RESOLUTIONS, PROCLAMATIONS, AND ACKNOWLEDGEMENTS

7:30-7:35

1. [15-0363](#) Advanced Firefighter Certificate

PURPOSE: The purpose is to present Firefighter Hendrix Valenzuela the Advanced Firefighter Certificate.

7:35-7:55

2. [15-0369](#) “Creeping in Carrboro...You Buy What?” Presentation by McDougle Middle School Students

7:55-8:00

B. CONSENT AGENDA

1. [15-0364](#) Request to Approve a Supplemental Agreement with North Carolina Department of Transportation (NCDOT) for an extension of the Construction Completion date for the Rogers Road Sidewalk Project

PURPOSE: The Board is requested to approve a Supplemental Agreement with NCDOT allowing the project completion date to be extended to December 17, 2017.

Attachments: [SupplementalAgreement6028 \(002\)](#)
[Resolution 15 0364](#)

C. WORK SESSION

8:00-8:15

1. [15-0366](#) Draft Solid Waste Study Scope of Work

PURPOSE: The purpose of this item to for the Board of Aldermen to review a proposed scope of work to be included in a Request for Proposals (RFP) for a Solid Waste Study.

Attachments: [Attachement A: Draft Scope of Work](#)

8:15-8:35

2. [15-0245](#) Consideration of Proposed Changes to the Unified Animal Ordinance

PURPOSE: The purpose of this item is to allow the Board to discuss, and possibly adopt, amendments to Chapter 10 of the Town of Carrboro Code of Ordinances, such amendments to become effective upon Orange County's adoption of a unified Animal Control Ordinance, which will create a common framework for animal services while allowing for some specific provisions that are unique to the Town of Carrboro and other jurisdictions.

Attachments: [Attachment A: Agenda version Draft Ordinance v 8.docx](#)
[Attachment B: Memorandum to Chief Horton.doc](#)
[Attachment C: Changes - Carrboro Animal Control Ordinance](#)
[Attachment D: Ordinance \(FINAL\) amending Animal Control Ordinance 11-2-15 rev reh.doc](#)
[Attachment E: RESOLUTION \(FINAL\) AUTHORIZING ORANGE COUNTY ANIMAL CONTROL.docx](#)

8:35-8:50

3. [15-0365](#) North-South Corridor Study Presentation

PURPOSE: The purpose of this item is for the Board of Aldermen to receive a presentation from Chapel Hill Transit staff and consultants on the status of the North-South Corridor Study on Bus Rapid Transit in Chapel Hill.

Attachments: [Attachment A_N-S Corridor Study Memo](#)
[Attachment B Corridor Map](#)
[Attachment C Schedule](#)
[Attachment D Alternatives](#)

8:50-9:30

4. [15-0359](#) Energy and Climate Action Task Force Community Climate Action Plan

PURPOSE: The purpose of this item is for the Energy and Climate Action Task Force to provide an update on the draft Community Climate Action Plan

Attachments: [Task Force Resolution](#)
[TaskForceReviewMemo](#)
[CommunityClimateActionPlan](#)
[AdvisoryBoardComments](#)
[StormwaterUtility FAQ](#)

9:30-9:50

5. [15-0368](#) Update on status of the Durham-Orange Light Rail Transit Project (D-O LRT)

PURPOSE: The purpose of this item is for the Board of Aldermen to receive an update on the project, and provide comments for DCHC-MPO Transportation Board

Attachments: [Attachment A - Resolution 11-10-15- D-O LRT](#)
[Attachment B - DOLRT - Letter 10-13-15](#)
[Attachment C - D-O LRT Newsletter](#)
[Attachment D - D-O LRT Fast Facts](#)

D. MATTERS BY BOARD MEMBERS

E. MATTERS BY TOWN MANAGER

F. MATTERS BY TOWN ATTORNEY

G. MATTERS BY TOWN CLERK



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Agenda Item Abstract

File Number: 15-0363

Agenda Date: 11/10/2015

File Type: Agendas

In Control: Board of Aldermen

Version: 1

TITLE:

Advanced Firefighter Certificate

PURPOSE: The purpose is to present Firefighter Hendrix Valenzuela the Advanced Firefighter Certificate.

DEPARTMENT: Fire-Rescue Department

CONTACT INFORMATION: Susanna Schmitt Williams, Fire Chief

INFORMATION: The Advanced Firefighter Certificate is awarded to firefighters who have shown a commitment to education, professional training, and on-the-job experience. It is a recognition for individuals achieving high training standards as set forth by the NC State Fireman's Association and is the highest award a firefighter in the state can receive from the NC State Fireman's Association. This prestigious award goes above the NC Office of the State Fire Marshal initial firefighter certification requirements.

Since its inception in 2004, only 784 firefighters have been awarded the Advanced Firefighter Certificate. Out of 55,000 FF in our state, only 1.4% have attained this achievement.

We are here tonight to present to Firefighter Hendrix Valenzuela his Advanced Firefighter Certificate and congratulate him on now being one of 1.4% of firefighters in the state to achieve this award.

The certificate reads:

"Be it known that in recognition of the attainment of training and educational objectives commensurate with the role of volunteer or career firefighter and of the personal devotion and service to the people of North Carolina, the Board of Directors and the Executive Director do hereby award to Hendrix Alexis Valenzuela this Advanced Firefighter Certificate.

FISCAL & STAFF IMPACT: None.

RECOMMENDATION: None.



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Agenda Item Abstract

File Number: 15-0369

Agenda Date: 11/10/2015

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In Control: Board of Aldermen

Version: 1

“Creeping in Carrboro... You Buy What?” Presentation by McDougle Middle School Students

McDougle Middle School Students, taught by Business and Technology teacher Jennifer Morgan, will present their findings of a survey to the Board of Aldermen. In this project, student groups began by hypothesizing what consumers need and want in Carrboro. Then student groups surveyed their assigned target market to obtain the local consumer perspective. The target markets were: visitors, people under the age of 18, people on Weaver Street Lawn, and people in and on Main Street.



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Agenda Item Abstract

File Number: 15-0364

Agenda Date: 11/10/2015

File Type: Agendas

In Control: Board of Aldermen

Version: 1

TITLE:

Request to Approve a Supplemental Agreement with North Carolina Department of Transportation (NCDOT) for an extension of the Construction Completion date for the Rogers Road Sidewalk Project

PURPOSE: The Board is requested to approve a Supplemental Agreement with NCDOT allowing the project completion date to be extended to December 17, 2017.

DEPARTMENT: Public Works

CONTACT INFORMATION: JD Freeman, Public Works Director, 918-7427

INFORMATION: On February 7, 2011, the Board of Alderman approved a Municipal Agreement (ID#2040) with the NCDOT for design and construction of the Rogers Road Sidewalk (NCDOT TIP #U 4726 DD). This Agreement was subsequently executed by the NCDOT on February 16, 2011. [The Agreement established time frames for submittals, funding sources, and the project completion date.](#) The construction of the sidewalk is being funded through a federal Surface Transportation Program - Direct Apportionment (STP-DA) grant, with an 80% reimbursement rate and 20% municipal participation.

Since the original agreement, two (2) Supplemental Agreements have been approved of by the Board of Alderman for time extensions. The most recent Supplemental Agreement (ID#4997) includes a time extension with the current project completion date of December 31, 2015 and the addition of [NCDOT participation] supplemental funds. The Board of Alderman approved of the previously mentioned Supplemental Agreement, along with appropriation of bond funds and the amending of the Capital Project Ordinance on June 24, 2014.

A number of circumstances contributed to the need for a time extension including design revisions requirements and setbacks in obtaining easements.

FISCAL & STAFF IMPACT: None

RECOMMENDATION: Staff recommends that the Board adopt the attached resolution authorizing

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Version: 1

the Town Manager to execute a supplemental agreement for the Rogers Road (U-4726 DD) Sidewalk Project, extending the project completion to December 31, 2017.

NORTH CAROLINA
ORANGE COUNTY

3rd SUPPLEMENTAL AGREEMENT

DATE: 10/14/2015

NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION

TIP #: U-4726 DD

AND

WBS ELEMENTS: PE 36268.1.25

ROW _____

TOWN OF CARRBORO

CON 36268.3.25

OTHER FUNDING:

FEDERAL-AID #: STPDA-0702(22)

CFDA #: 20.205

TOTAL SUPPLEMENTAL FUNDS [NCDOT PARTICIPATION] \$0

THIS AGREEMENT is made and entered into on the last date executed below, by and between the North Carolina Department of Transportation, an agency of the State of North Carolina, hereinafter referred to as the "Department", and the Town of Carrboro, hereinafter referred to as the "Municipality."

WITNESSETH:

WHEREAS, the Department and the Municipality on 2/16/2011, entered into a certain Project Agreement for the original scope: designing and constructing a sidewalk on the west side of Rogers Rd from Homestead Rd to Meadow Run Ct., programmed under Project U-4726 DD; and,

WHEREAS, the Municipality has requested to extend the Project completion date,

NOW THEREFORE, the parties wish to supplement the aforementioned Agreement whereby the following provisions are amended:

RESPONSIBILITIES

The Municipality shall complete all work outlined in the Agreement by December 31, 2017.

Completion for this Agreement is defined as completion of all construction activities or implementation activities, acceptance of the project, and submission of a final reimbursement package to the Department.

If additional time is needed to complete the Project, then a supplemental agreement must be executed. The Department and/or FHWA reserves the right to revoke the funds awarded if the Municipality is unable to meet milestone dates included herein.

Except as hereinabove provided, the Agreement heretofore executed by the Department and the Municipality on 2/16/2011, 2/11/2013, and 7/30/2014 are ratified and affirmed as therein provided.

IN WITNESS WHEREOF, this Agreement has been executed, in duplicate, the day and year heretofore set out, on the part of the Department and the Municipality by authority duly given.

L.S. ATTEST:

TOWN OF CARRBORO

BY: _____

BY: _____

TITLE: _____

TITLE: _____

DATE: _____

DATE: _____

NCGS 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

Approved by _____ (Governing Board) of the Town of Carrboro as
attested to by the signature of _____, Clerk of the
_____ (Governing Board) on _____ (Date)

(SEAL)

Remittance Address:

Town of Carrboro

DEPARTMENT OF TRANSPORTATION

BY: _____

(CHIEF ENGINEER)

DATE: _____

APPROVED BY BOARD OF TRANSPORTATION ITEM O: _____ (Date)

ATTACHMENT A

RESOLUTION NUMBER 15-0364

A RESOLUTION AUTHORIZING THE TOWN MANAGER TO EXECUTE ON BEHALF OF THE TOWN OF CARRBORO A SUPPLEMENTAL AGREEMENT EXTENDING THE PROJECT COMPLETION DATE TO DECEMBER 31, 2017, FOR THE PROJECT KNOWN AS THE TOWN OF CARRBORO (U-4726 DD) ROGERS ROAD SIDEWALK PROJECT

WHEREAS, on On February 7, 2011, the Board of Alderman approved a Municipal Agreement (ID#2040) with the NCDOT for design and construction of the Rogers Road Sidewalk (NCDOT TIP #U 4726 DD); and

WHEREAS, the Municipal Agreement has been executed by the North Carolina Board of Transportation, and the Town has received authorization for preliminary engineering design for the project;

BE IT RESOLVED BY THE BOARD OF ALDERMAN OF THE TOWN OF CARRBORO:

Section 1. The Town Manager of the Town of Carrboro is hereby authorized to execute on behalf of the Town of Carrboro the attached Supplemental Agreement extending the Project Completion date to December 31, 2017 for the Town of Carrboro (U-4726 DD) Rogers Road Sidewalk Project, provided the agreement is subsequently approved by the North Carolina Department of Transportation.

Section 2. The resolution shall become effective upon adoption.

This is the 10TH day of November, 2015.



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Agenda Item Abstract

File Number: 15-0366

Agenda Date: 11/10/2015

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In Control: Board of Aldermen

Version: 1

TITLE:

Draft Solid Waste Study Scope of Work

PURPOSE: The purpose of this item to for the Board of Aldermen to review a proposed scope of work to be included in a Request for Proposals (RFP) for a Solid Waste Study.

DEPARTMENT: Public Works & Town Manager's Office

CONTACT INFORMATION: JD Freeman 919-918-7427, Julie Eckenrode 919-918-7308

INFORMATION: The Public Works Department and Town Manager's Office have collaborated to create a scope of work for a Solid Waste Study. Staff have reviewed similar scopes of work from studies completed within North Carolina and nationwide as well as engaged Rob Taylor, Local Government Team Leader for the North Carolina Department of Environmental Quality (NCDEQ). From the complied research, assistance of Mr. Taylor, and direction of the Board and Town Manager, the attached scope of work was developed to be included in an RFP to hire a consultant for a Solid Waste Study.

FISCAL & STAFF IMPACT: There is a \$50,000 budget for this study and Public Works estimates an additional 8 hours of staff time.

RECOMMENDATION: Staff recommends that the Board of Aldermen review the proposed scope of work and give feedback including direction on the Pay As You Throw Option so the RFP can be completed and opened as soon as possible.

Solid Waste Study Scope of Work- Draft

Public Participation

At the outset of the planning process, the consulting team will meet with town staff to develop a public participation plan. This plan may include holding public forums, focus groups, developing and executing surveys, utilizing the Town's Engage Carrboro tool (a public input site powered by MySidewalk), and other public outreach methods. It may occur prior, during, or after data collection and before any pilot program is proposed.

Consulting team tasks

- Coordinate with town staff to develop a public participation plan
- Execute public participation plan with town staff

Assessment of Current Waste Programs

Work with Carrboro staff to prepare an analysis of current solid waste services. Measure and profile the current cost of each of the residential waste collection services (MSW, bulky waste, and yard waste). Determine the current tonnages of materials collected. Determine the cost of each service per household unit and per ton collected.

Residential Waste Characterization Study

The Consultant will work with Town staff to select a representative sample of residences from each route day to audit (also known as a cart audit) to complete a residential waste characterization study. The trash study will evaluate what is being thrown away as well as the fullness or capacity of municipal trashcans on trash pick-up day. As a basis for preparing cost estimates the Consultant should plan to utilize same waste categories as used in the 2010 Orange County waste characterization study, though final categories may include some changes and will be determined in coordination with Town staff.

Consulting team tasks

- Coordinate with Town staff to prepare a methodology that will result in a residential waste characterization study that is representative of the town as a whole.
- Collect additional data as necessary (may also be completed by Town staff)

Residential Waste Collection Route Study

The consulting team will conduct a residential waste collection route study to evaluate several perceived issues. The study should determine if current residential waste routes are the most efficient for collecting waste in the area serviced by Carrboro Public Works to include maximizing the productivity of the recently purchased E3-hybrid trash collection truck. It should also evaluate the possibility of route reduction (i.e. pick-up every 10 days,

every other week, or other possible options). Data from the residential waste characterization study should be utilized to assess pick-up frequency and suggested container size.

Consulting team tasks

- Design the study by utilizing a route list with addresses served each day
- Determine how to maximize collection efficiency and reduce the truck hours
- Determine if a pilot program changing pick-up frequency would be appropriate
- Evaluate implications of route reduction/frequency

Using data collected in the waste characterization study, route study, and considering the study area, analyze the possibility of route reduction and/or realignment for areas serviced by Carrboro solid waste services. The analysis should provide multiple options and presenting the pros and cons of each option. The analysis should also provide recommendations for methods that can be used to maintain route efficiency as the Town grows and as new services are implemented which impact the amount of waste generated.

Residential Organics Collection

The consulting team will collect data and review other residential organics collection programs nationwide to explore in detail the possibility of residential organics collection in Carrboro. Working with Town staff and North Carolina Department of Environmental Quality, the appropriate data should be collected to determine if a residential organics collection is plausible and viable for the Town of Carrboro. This should include data about potential costs for the implementation of a residential organics collection program. This may include engaging local, private composting companies and/or evaluating current partnerships with Orange County, and evaluating partnerships with other potential partners such as OWASA.

Consulting team tasks

- Evaluate collection system options (how the material will be picked up)
- Evaluate processing options for the collected materials (where the collected material will go and what will happen to it)
- Determine if a pilot program would be appropriate
- Evaluate implications of residential organics collection

Using data collected in the waste characterization study, route study, and considering the study area, analyze the possibility of a residential organics collection. The analysis should provide multiple options and presenting the pros and cons of each option.

Prepare Recommendations For the Development of a Residential Organics Pilot Program

Dependent upon the data collection and analyses previously described, feedback from the public, and direction from Town staff and the Board of Aldermen develop a pilot program to implement a residential organics collection program, route changes, or combination. This

should include the selection of a pilot area and detailed description the pilot program including recommended length and instructions for successful implementation.

Consulting team tasks

- Determine a recommended pilot program area of implementation
- Detailed description and cost of pilot program
- Project cost of program implementation town-wide

Final Product

The consultant will compile the information collected from the public, data collected as described above, and aforementioned analysis into a comprehensive, well-organized, and clear Solid Waste Study document that describes issues laid out in the scope of work and provides recommendations to inform the future of solid waste services in Carrboro. Goals developed early in the process should be included.

Consulting team tasks

- Develop a draft version of the deliverables for staff review
- Develop a revised draft version for presentation at a Board of Aldermen meeting
- Revise the deliverable into a final draft to be considered for adoption

THE LAST OPTION SHOUL BE PRICED SEPARATELY AS A POSSIBLE ADD-ON TO THE PROJECT.

Pay As You Throw

The consulting team will collect data and review other pay as you throw (PAYT) programs nationwide to explore in detail the possibility of a PAYT program in Carrboro. Working with Town staff and North Carolina Department of Environmental Quality, the appropriate data should be collected to determine if a PAYT program is plausible and viable for the Town of Carrboro. This may include engaging local, private collection companies and/or evaluating current partnerships with Orange County and surrounding municipalities.

Consulting team tasks

- Collect and evaluate are relevant data
- Determine if a pilot program would be appropriate
- Evaluate implications of residential organics collection

Using data collected in the waste characterization study, route study, and considering the study area, analyze costs and benefits of a PAYT program as it relates to Carrboro and current relationships with surrounding towns and the county. The analysis should provide multiple options and presenting the pros and cons of each option.



Town of Carrboro

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Agenda Item Abstract

File Number: 15-0245

Agenda Date: 11/10/2015

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Version: 1

TITLE:

Consideration of Proposed Changes to the Unified Animal Ordinance

PURPOSE: The purpose of this item is to allow the Board to discuss, and possibly adopt, amendments to Chapter 10 of the Town of Carrboro Code of Ordinances, such amendments to become effective upon Orange County's adoption of a unified Animal Control Ordinance, which will create a common framework for animal services while allowing for some specific provisions that are unique to the Town of Carrboro and other jurisdictions.

DEPARTMENT: Police Department

CONTACT INFORMATION: Chief Walter

INFORMATION: : On April 7, 2015, the Unified Animal Ordinance (UAO) was presented to the Board. After the presentation, Board Members had questions about the appeal process as it pertains to Carrboro. Staff was asked to ensure that Carrboro's Animal Control Board of Appeals could still function in its current role as stated in Carrboro's Animal Control Ordinance section 10-38. Orange County Staff made a change to the UAO to reflect this change, see Attachment A.

The Board also had several other questions or concerns they wished addressed by staff before they considered adopting the UAO. Orange County Attorney Annette Moore answered these questions in a memo. See Attachment B.

It is anticipated that the Orange County Board of County Commissioners will adopt the unified Animal Control Ordinance within the next month. Therefore, we have prepared (a) An Ordinance Amending Chapter 10 of the Carrboro Town Code (Animal Control), and (b) a Resolution Authorizing Orange County Animal Control Ordinance to be Applicable within the Town of Carrboro. The proposed Ordinance and Resolution by their terms will be effective on the effective date of the proposed revised unified Orange County Animal Control Ordinance so that there is no "gap" in regulation between the time we adopt the Chapter 10 amendments and the time the County adopts the unified Animal Control Ordinance.

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FISCAL & STAFF IMPACT: The unified animal ordinance has no financial impacts in and of itself. Because it does not create new laws but rather brings together the best elements of existing ordinances, its enactment will not entail additional services or additional layers for existing services. To the extent that there is a unified ordinance in the county for the first time, it is hoped and expected that that service will become more effective and efficient as a result of there being more coherence and clarity about the general regulatory framework for animal care and control in the county.

RECOMMENDATION: Staff recommends that the Board review and, if appropriate, approve the Ordinance Amending Chapter 10 of the Carrboro Town Code and the Resolution Authorizing Orange County Animal Control Ordinance to be Applicable within the Town of Carrboro .

Animal Control Ordinance

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Animal Control Ordinance

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Animal Control Ordinance

DIVISION 1. - GENERALLY

Sec. 4-31. - Authority.

This Ordinance is adopted pursuant to the power granted Orange County in N.C. Gen. Stat. §§ 153A-121, 153A-127, 153A-153 and 153A-442.

(Ord. of 6-16-1987, § I, eff. 1-1-1988)

Sec. 4-32. - Applicability to animal shelter.

Orange County shall operate and maintain a County Animal Shelter for the purpose of impounding or caring for animals held under the authority of state law, this Ordinance or any other county or municipal ordinance. Orange County may contract for the operation of the Animal Shelter as it deems appropriate.

(Ord. of 6-16-1987, § XVIII, eff. 1-1-1988)

Sec. 4-33. - Animal control officers.

- (a) Orange County may appoint one or more Animal Control Officers. Any County employee designated by the County Manager with the duties of an Animal Control Officer shall also be designated as Animal Cruelty Investigators. Only Orange County employees shall be designated as an Animal Cruelty Investigators.
- (b) Animal Control Officers shall have only the following powers and duties within Orange County and within any municipality therein that has given prior approval therefore:
 - (1) The responsibility for the enforcement of all state and local laws including ordinances, resolutions and proclamations pertaining to the ownership and control of dogs and other animals.
 - (2) To cooperate with the County Health Director and all law enforcement officers in the county and the towns therein and assist in the enforcement of the laws of the state with regard to animals, the vaccination of dogs and cats against rabies, the confinement and leashing of vicious animals, and any other state law applicable to animals or animal control.
 - (3) To investigate reported or observed animal cruelty or animal abuse and make written reports of such investigations and, when requested, provide such reports to animal , appropriate law enforcement officers or the District Attorney's office.
 - (4) To investigate reports of observed harassment or attacks by dogs or other animals against domesticated livestock and to assist in locating those persons owning or harboring the attacking animals.
 - (5) ~~County~~ Animal Control Officers shall not have the power to arrest.

Animal Control Ordinance

Sec. 4-34. - Animal license privilege taxes.

The Owner of every dog or cat over four (4) months of age that is kept within the County shall annually pay to the County, through Orange County Animal Services, a tax on the privilege of keeping such animal within the County.

Orange County may set animal license privilege taxes as allowed by law and set the tax amounts annually as part of the Budget. In order to further the goals of controlling animal population, the taxes of unspayed or unneutered dogs and cats shall be higher than those of neutered animals. Within 30 days of acquisition of an animal for which a license is required, the owner or keeper shall purchase the appropriate county license.

(Ord. of 3-15-88, § IV, eff. 3-15-88; Amend. of 12-2-96, eff. 1-1-97)

Sec. 4-35. - Licenses, permits, registrations, and fees required by this ordinance.

(a) The following licenses, permits, and registrations are required by this Ordinance:

- (1) Licenses for dogs, cats, or other animals designated by either the Board of County Commissioners or other local government body, in their respective Budget Ordinance (see Section 4-34).
- (2) Registration of patrol dogs or sentry dogs (see Section 4-42(d)).
- (3) Rabies vaccination tags for dogs and cats (see Section 4-47).
- (4) Permits for collecting of dogs and cats for sale (see Section 4-96).
- (5) Permits for commercial (Class II) kennels, non- commercial (Class I) kennels and pet shops (see Sections 4-71 and 4-73).

(b) The amount of license privilege tax shall be recommended by the Animal ~~Control~~ Services Director and approved by the Board of Commissioners, or other local government body, in their respective Budget Ordinance. The Animal ~~Control~~ Services Director may propose for approval by the Board of Commissioners or other local government body such policies or procedures as may be necessary or appropriate to allow for payment of privilege taxes over extended periods of time, at reduced rates, or a waiver of privilege taxes. Additionally, dog and cat owners or keepers who furnish to the Animal ~~Control~~ Services Director a statement from a licensed veterinarian that the animal, due to age, physical reasons, or chronic health problems cannot withstand spay/neuter surgery, shall be allowed to pay the license privilege taxes provided for spayed or neutered animals.

(c) When an animal is impounded under this Ordinance there shall be paid, in accordance with Section 4-43, a redemption privilege tax.

Animal Control Ordinance

(1) The Redemption Privilege Tax shall be:

| Number of Prior Incidents | Redemption or Impoundment Privilege Tax <u>Sterilized Animal</u> | Redemption or Impoundment Privilege Tax <u>Reproductive Animal</u> |
|---------------------------------|--|--|
| | | |
| 0 | <u>\$25.00</u> | <u>\$50.00</u> |
| 1 | <u>\$50.00</u> | <u>\$100.00</u> |
| 2 | <u>\$100.00</u> | <u>\$200.00</u> |
| 3 or more | <u>\$200.00</u> | <u>\$400.00</u> |

(2) For reproductive animals with two or more prior incidents, \$100 of the redemption privilege tax shall be considered a sterilization deposit, which may be refunded to the owner if they provide to Animal Services proof of sterilization in the form of a veterinarian record within 90 days of recover of the animal.

(d) In order to defray the costs of administering and enforcing ordinances adopted under this Chapter, and in order to account for the additional costs of locating, responding to and caring for unvaccinated and unlicensed animals found within the County, additional fees shall be assessed as follows if the Owner or Keeper of an animal fails to pay the following fees within the time specified in the Ordinance:

Failure to Vaccinate for Rabies (Section 4-46) \$ 200.00

Failure to Wear Rabies Tag (Section 4-47) \$ 50.00

Failure to License (Section 4-35) \$ 200.00

(e) For any stray animal that has been impounded by Animal Services there shall be a microchip fee that shall be determined by the Board of County Commissioners in the Budget Ordinance.

(f) Inspection fees, as provided in this Chapter, shall be set by the Board of County Commissioners in the Budget Ordinance.

(Ord. of 6-16-1987, § V, eff. 1-1-1988; Amend. of 12-2-1996, eff. 1-1-1997; Ord. of 12-3-2007, eff. 7-1-2008)

Sec. 4-36. - Ordinance.

All other Orange County ordinances in conflict with this Ordinance, ~~except the Ordinance Prohibiting the Keeping of Wild Animals Dangerous to Persons and Property within Orange County,~~ are hereby repealed to the extent they conflict with this

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Ordinance. The Ordinance to Provide for Animal Control and Protection in Orange County, adopted May 15, 1979, as amended October 3, 1983, is hereby repealed.

(Ord. of 6-16-1987, § VI, eff. 1-1-1988)

Sec. 4-37. - Definitions.

As used in this Chapter, the following terms mean:

Adequate Food: The provision at suitable intervals, not to exceed 24 hours, of a quantity of wholesome foodstuff suitable for the species and age, sufficient to maintain a reasonable level of nutrition in each animal. Such foodstuff shall be served in a receptacle, dish, or container that is physically clean and in which agents injurious to health have been removed or destroyed to a practical minimum.

Adequate Shelter: That shelter which will keep a nonaquatic animal dry, out of the direct path of winds and out of the direct sun, at a temperature level that is healthful for the animal. For dogs, cats and other small animals, the shelter shall be a windproof and moisture-proof structure of suitable size to accommodate the animal and allow retention of body heat. It shall include four walls, a roof and a solid floor raised up off of the ground, with an opening entrance large enough to allow access to the animal, but placed in such a way as to keep the animal out of the direct path of winds. Metal barrels do not provide adequate shelter for a dog, cat or other small animal and are prohibited for that purpose. The structure shall be provided with a sufficient quantity of suitable bedding material consisting of hay, straw, cedar shaving, or the equivalent. For all animals the containment area shall be free of accumulated waste and debris so that the animal shall be free to walk or lie down without coming in contact with any such waste or debris, and a suitable method of draining shall be provided to rapidly eliminate excess water or moisture. Aquatic or semi-aquatic animals shall have an adequate amount of clean water in which to move.

Adequate Water: A constant access to a supply of clean, fresh water provided in a sanitary manner. In near or below freezing temperatures the water must be changed frequently to prevent freezing, unless heated.

Administrator: The Animal Services Director, or their designee, as designated by the County Manager to perform the responsibilities assigned by this chapter to the Administrator.

Animal: Any live, vertebrate creature specifically including but not limited to dogs, cats, farm animals, birds, fish, livestock, and reptiles.

Animal ~~Control~~ Services Director: That person designated by the Board of Commissioners and the County Manager in Orange County, and where appropriate, his or her designee, charged with the responsibility, discretion and authority to interpret, implement and enforce the Animal Control program in Orange County.

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Animal Shelter: A place provided and operated by Orange County directly or by contractual agreement, whether jointly with another governmental unit or independently, for the restraint, care, adoption, and disposition of animals.

At Large: Any animal shall be deemed to be at large when it is off the property of its owner or its keeper and not under the restraint of a competent person. For purposes of this definition, the term "real property of its owner or keeper" shall include any property owned or occupied by the owner or keeper of such animal but shall not include any of the common areas (including without limitation, walks, drives, recreation and open space areas, etc.) within any subdivision or multifamily residential development.

~~*Class I Kennels:* An establishment maintained by any person where animals of any species, excluding domesticated livestock, are kept for the purpose of showing, competition, hunting or sport, and which establishment is so constructed that the animals cannot stray therefrom, and which maintains more than six but less than 19 animals.~~

~~*Class II Kennels:* Any person maintaining an establishment where animals of any species excluding domesticated livestock, kept for the purpose of breeding, buying, selling, or boarding such animals or engaged in the training of dogs for guard or sentry purposes, and which establishment is so constructed that the animals cannot stray therefrom; or any person owning or keeping 20 or more animals, excluding domesticated livestock, each of which is four months of age or older.~~

Competent Person: A person of suitable age and discretion to keep an animal under sufficient restraint and control in order to prevent harm to the animal, to persons, to other animals, including but not limited to domesticated livestock, or to property.

Cruel and Cruel Treatment: Every act, omission, or neglect whereby unjustifiable physical pain, suffering, or death is caused or permitted. Such acts or omissions shall include, but not be limited to: beating, kicking, hanging, submerging under water, suffocating, poisoning, setting on fire, confining in a closed vehicle without functioning air conditioning or ventilation whenever the ambient temperature exceeds seventy (70) degrees Fahrenheit, confining in the closed trunk of a vehicle and depriving of food, water, and medical treatment, or otherwise subjecting the animal to conditions detrimental to its health or general welfare. Such terms, however, shall not be construed to include lawful taking of animals under the jurisdiction and regulation of the Wildlife Resources Commission, lawful activities sponsored by agencies conducting biomedical research or training, lawful activities for sport.

Display: Display shall mean any exhibition, act, circus, public show, trade show, photographic opportunity, carnival ride, parade, race, performance, or similar undertaking in which animals are required to perform tricks, fights, wrestle or participate in performances for the amusement or entertainment of an audience, whether or not a fee is charged. "Display" shall not include the use or exhibition of animals for animal-related educational purposes by non-profit groups or institutions or individuals. "Displayed" means to be the subject thereof.

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Domestic Animal: A domesticated or tame animal that is kept principally as a pet, except that livestock (other than rabbits kept as pets and not for productive purposes) and wild animals shall not be regarded as domestic animals.

Domesticated Livestock: Livestock raised for the production of meat, milk, eggs, fiber, or used for draft or equestrian purposes, including but not limited to cattle, sheep, goats, swine, horses, mules, rabbits, and poultry.

Educational Purposes: Teaching and instructing with the intent and effect of imparting knowledge to others.

Exotic animals: Exotic animals are animals other than domestic animals, farm animals, and wild animals which are not native to North Carolina, or are native to North Carolina but have been captive-bred.

Exposed to Rabies: An animal has been exposed to rabies within the meaning of this Ordinance if it has been bitten by, or otherwise come into contact with the saliva or nervous tissue of a proven rabid animal or animal reasonably suspected of having rabies that is not available for laboratory diagnosis.

Harbor: An animal shall be deemed to be harbored if it is fed or sheltered by the same person or household for 72 consecutive hours or more.

Health Department: Orange County Health Department.

Health Director: Director of the Orange County Health Department.

Injury: Any injury which is serious enough to require immediate medical attention to preserve the life of the injured person.

Keeper: A person having custody of an animal or who keeps or harbors an animal or who knowingly permits an animal to remain on or about any premises occupied or controlled by such person, whether or not that person literally "owns" the animal. Every person 18 years or older residing in the dwelling unit where a pet is harbored and/or kept shall be deemed a keeper for purposes of this Ordinance.

Leash-free Area: An area in a Town or County designated by the governing body of said Town or County which permits an animal to go free from physical restraint. Does not apply to animals deemed vicious, potentially dangerous or dangerous.

Other Local Government Body: Other local government authority shall include the Towns of Carrboro, Chapel Hill and Hillsborough and those parts of the City of Durham located in Orange County.

Owner: Any person who owns any animal and is responsible for its care, actions, and behavior.

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Owner or Keeper's Premises: Any real, owned or leased, property of the owner of an animal; excluding any public right-of-way, or common area of a condominium, apartment complex or townhouse development.

Person: Any individual, family, group of individuals, corporation, partnership, organization, or institution recognized by law as a person.

~~*Pet Shop:* A person that acquires for the purposes of resale animals, excluding domesticated livestock, bred by others whether as owner, agent, or on consignment, and that sells, trades or offers to sell or trade such animals at retail or wholesale, or a person that holds or keeps animals, excluding domesticated livestock, for the purpose of cleaning or grooming.~~

Provocation: Any act that would reasonably be expected to cause an animal to defend itself, its young, its owner or keeper or the property of said owner or keeper.

~~*Public Nuisance:* Actions deemed prima facie evidence of a public nuisance include the following activities of an animal, or conditions maintained or permitted by the animal's owner or keeper:~~

- ~~(1) — The animal is found at large off as defined in this section.~~
- ~~(2) — The animal damages the property of anyone other than its owner or keeper, including, but not limited to, turning over garbage containers or damaging gardens, flowers, shrubbery, vegetables or trees, fences or gates, or causes injury to domesticated livestock or pets.~~
- ~~(3) — The animal habitually and repeatedly barks, whines, or howls so as to interfere seriously with the reasonable use and enjoyment by neighboring residents of their property.~~
- ~~(4) — The animal repeatedly chases, snaps at, or barks at persons, domesticated livestock, pets, or vehicles when it is not in an enclosure, leashed, or on the owner's or keeper's property.~~
- ~~(5) — The owner or keeper fails to confine a female dog while in heat (estrus) in a building or secure enclosure in such a manner that she will not be in contact with another dog, provided, this section shall not be construed to prohibit the intentional breeding of animals within an enclosed area on the premises of the owner or keeper of an animal involved in the breeding process~~

Restraint: An animal is under restraint if it is under sufficient physical restraint such as a leash, cage, bridle, or similar effective and humane device which restrains and controls the animal, or within a vehicle, or adequately contained by a fence on the premises or other secure enclosure as permitted in this Ordinance. If a competent adult is physically outside on the land with the animal, on land where the owner or keeper of the animal resides, then the animal shall be deemed to be under restraint during the time the animal is in the company of and under the control of that competent person and the animal is on the premises. If any unattended animal is restrained by a chain, leash or similar restraint, it shall be designated and placed to prevent choking or strangulation.

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Such chain or restraint shall not be less than ten feet in length and shall be on a swivel designed to prevent the animal from choking or strangling itself. The restraint of unattended dogs by a fence, kennel, outdoor enclosure, chain, leash or similar restraint is further regulated under this Ordinance.

Security Dog: Any dog used, kept or maintained on the premises of its owner or keeper for the purpose of protecting any person or property. Any such dog shall be further classified as a patrol dog or sentry dog.

- (a) Patrol dog: A dog that is trained or conditioned to attack or otherwise respond aggressively, but only upon command from a handler either off or on lead.
- (b) Sentry dog: A dog that is trained or conditioned to attack or otherwise respond aggressively without command.
- (c) ~~Watch dog: A dog that barks and threatens to bite any intruder that has not been specially trained or conditioned for that purpose.~~

Secure Enclosure: An enclosure from which an animal cannot escape by means of digging under or jumping over the enclosure, or otherwise becoming free unless freed by the owner or keeper. A motor vehicle shall not constitute a secure enclosure. Minimum space and height requirements and other specifications for secure enclosures shall be obtained from the Animal Services Director based on breed, age, height, weight, temperament, and history of the animal.

Severe injury: Any physical injury that results in broken bones, or disfiguring lacerations or requires cosmetic surgery or hospitalization.

Steel Jaw Trap: Spring-powered devices or traps which capture or hold an animal by exerting a lateral force with fix mounted jaws on the leg, toe, paw, or any other part of the animal's body.

Stray: Any domestic animal that is not under restraint or is not on the property of its owner and is wandering at large, or is lost, or does not have an owner, or does not bear evidence of the identification of any owner.

Suspected of Having Rabies: An animal which has bitten a person or another animal.

Tethering: To restrain a dog outdoors by means of a rope, chain, wire or other type of line for holding a dog one end of which is fastened to the dog and the opposite end of which is connected to a stationary object or to a cable or trolley system. This does not include walking a dog with a handheld leash.

Veterinary Hospital: Any place or establishment which is maintained and operated under the supervision of a licensed veterinarian as a hospital where animals are harbored, boarded and cared for incidental to the treatment, prevention or alleviation of

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disease processes during the routine practice of the profession of veterinary medicine for surgery, diagnosis and treatment of diseases and injuries of animals.

~~*Vicious Animal:* Any animal on or off the premises of its owner or keeper, security dog excluded, which animal is three months of age or older and without provocation has bitten, or killed, or caused physical harm through bites to people (a person) who are (is) not trespassing and or has bitten or killed an animal(s) that is (are) not where its (their) owner(s) has (have) been told such animal(s) cannot be. Any dog that is owned or harbored for the purpose of dog fighting or training for dog fighting is also defined as a vicious animal.~~

Wild Animals: An animal (other than livestock) that typically is found in a non-domesticated state and that, because of its size or vicious propensity or because it is poisonous, venomous or for any other substantial reason, poses a potential danger to persons, other animals or property, whether bred in the wild or in captivity and includes any or all hybrids bred with these animals and domestic species.

(Ord. of 6-16-1987, § VII, eff. 1-1-1988; Amend. of 12-2-1996, eff. 1-1-1997; Amend. of 11-18-08, eff. 11-19-08)

Sec. 4-38. - Animal control program.

The Orange County Animal Control Program, as herein described and as otherwise described in other County ordinances related to animals and as otherwise described in the laws of North Carolina, shall be administered by the Animal Services ~~Control~~ Director. Specifically:

- (a) ~~The Animal Control Director shall designate employees or agents enforcing this Ordinance as Animal Control Officers and Rabies Control Officers. Animal Cruelty Investigators may be appointed by the Board of County Commissioners as provided by law. In the performance of their duties, officers and investigators shall have all the power, authority, and immunity granted under this Ordinance and by the general laws of this State to enforce the provisions of this Ordinance, and the laws of North Carolina as they relate to the care, treatment, control or impounding of animals. All investigations of reported or observed animal cruelty or animal abuse shall be the joint responsibility of and shall be jointly carried out by the Animal Cruelty Investigators and the Animal Control Officers of Orange County.~~
- (a) The Animal Services ~~Control~~ Director shall have the duties of Animal Control Officer and direct the duties of designated County employees or agents in carrying the enforcement of this Ordinance as Animal Control Officers including the duties of a Rabies Control Officers and Animal Cruelty Investigator.
- (b) Except as may be otherwise provided by law, no officer, agent, or employee of the County charged with the duty of enforcing the provisions of this Ordinance or other applicable laws, shall be personally liable for any damage that may accrue to persons or property as a result of any act required or permitted in the discharge of such duty unless he or she acts with actual malice.

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- (c) It shall be unlawful for any person to interfere with, hinder, or molest any Animal Control or police officer while in the performance of any duty authorized by this Ordinance, ~~or the Animal Control Program~~, or to seek to release any animal in the custody of said agents, except in the manner as herein provided.
- (d) Animal Control Officers, ~~Rabies Control Officer, and Animal Cruelty Investigators~~ are not authorized to carry on their person firearms of any kind except as provided herein. The Orange County Animal Control Program may store firearms at the ~~Health~~ Animal Services Department and use those firearms when necessary to enforce sections of this Chapter or under applicable law for the control of wild, vicious, or diseased animals.
- (1) Any Animal Control Officer or law enforcement officer, in carrying out their duties under this Chapter, shall make every effort to deal humanely with all animals.
- (2) An Animal Control Officer or law enforcement officer may inject an animal with a chemical tranquilizer which will result in limiting the activity of an animal, when in the officer's judgment any attempt to seize the animal would be dangerous to the person attempting the seizure, the animal, or the public at large.
- (3) An Animal Control Officer or law enforcement officer may humanely put an animal to death, if in the judgment of the officer an attempt to otherwise seize or impound the animal would be dangerous to the officer or others. It is the intent of this subsection that the killing of an animal would be done only after, within the sole discretion of the officer, other reasonable procedures are judged impossible.
- (e) The Animal Control Program shall:
- (1) Have the responsibility along with law enforcement agencies and where applicable with animal control officers to enforce all laws of North Carolina and all ordinances of Orange County pertaining to animals and shall cooperate with all law enforcement officers within Orange County in fulfilling this duty. Animal Control Officers in the performance of their duties, shall have all the power, authority, and immunity granted under this Ordinance and by the general laws of this State to enforce the provisions of this Ordinance, and the laws of North Carolina as they relate to the care, treatment, control or impounding of animals. All investigations of reported or observed animal cruelty or animal abuse shall be the responsibility of and shall be carried out by the Animal Control Officers.

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- (2) Enforce and carry out all laws of North Carolina and all ordinances of Orange County pertaining to rabies control.
- (3) Be responsible for the investigation of all reported animal bites, for the quarantine of any dog or cat exposed to or suspected of having rabies, for a period of not less than ten days, and for reporting to the Health Director as soon as practicable the occurrence of any such animal bite and the condition of any quarantined animal.
- (4) Be responsible for the investigation of reports or observations of incidents of harassment of or injuries to domesticated livestock caused by animals.
- (5) Be responsible for the seizure and arranging for the impoundment, where deemed necessary, of any dog or other animal in Orange County involved in a violation of this or any other County ordinance or state law.
- (6) Investigate cruelty or abuse with regard to animals ~~independently or with a duly appointed Animal Cruelty Investigator.~~
- (7) Make such investigations or inquiries as necessary for the purpose of ascertaining compliance with this Ordinance or applicable state statute.
- (8) Keep, or cause to be kept, accurate and detailed records of:
 - i. Seizure, impoundment, and disposition of all animals coming into the custody of the animal control program.
 - ii. Bite cases, violations and complaints, and investigation of same, including names and addresses of persons bitten, date, circumstances, and breed.
 - iii. Any other matters deemed necessary by the Animal ~~Control~~ Services Director.
- (9) Be empowered to issue citations or notices of violation of this Ordinance in such form as the Animal ~~Control~~ Services Director may prescribe.
- (10) Have employees who are trained to standards to be established by the Animal ~~Control~~ Services Director, which training shall include, but not be limited to, training in animal first aid taught by a licensed veterinarian.
- (11) The premises for all Animal Shelters operated by or for the County shall meet the standards prescribed for commercial (Class II) kennels set out in Section 4-72 of this Ordinance.

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- (12) The standards applicable to vehicles and care in transportation set out in Section 4-98 apply to Animal Control Officers collecting, transporting, or holding animals in this County.

(Ord. of 6-16-1987, § VIII, eff. 1-1-88)

Sec. 4-39. - Relation to hunting laws.

Nothing in this Ordinance is intended to be in conflict with the laws of the State of North Carolina regulating, restricting, authorizing or otherwise affecting dogs while used in hunting, but this exception applies only while the dogs are under the control of the owner, keeper, or competent person, and are actually lawfully being used for hunting or training for hunting in compliance with applicable statutes, regulations, or ordinances. This Ordinance should be read and enforced consistent with any such law.

(Ord. of 6-16-1987, § IX, eff. 1-1-88)

Sec. 4-40. - Notice in case of injury.

It shall be unlawful for any person who causes injury to an animal, including but not limited to, running over or hitting the animal with any vehicle, to fail to notify immediately at least one of the following:

- (1) The owner(s) or keeper(s) of the animal (if known or ascertainable with reasonable efforts made to locate the owner or keeper),
- (2) An Animal Control Officer,
- (3) Local law enforcement agency, or
- (4) Orange County Animal Services.

(Ord. of 6-16-1987, § X, eff. 1-1-88)

Sec. 4-41. - Mistreatment of animals unlawful.

The following acts or failure to act relating to the mistreatment of animals are unlawful and violations of this Ordinance:

- a. It shall be unlawful for any person to subject or cause to be subjected any animal to cruel treatment or to deprive or cause to be deprived any animal of adequate food and water, with respect to domesticated animals or wild animals in captivity or under restraint, it shall additionally be unlawful to deprive or cause to be deprived any such animal of adequate shelter or veterinary care.

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- b. It shall be unlawful for any person to sell or offer for sale, barter or give away within the County baby chickens, baby ducklings or other fowl under six weeks of age or rabbits under eight weeks of age as pets, toys, premiums or novelties; provided, however, that this section shall not be construed to prohibit the sale or display of such baby chickens, ducklings or other fowl or such rabbits in proper facilities with adequate food, water, and shelter, by breeders or stores engaged in the business of selling the animals for purposes other than as pets or novelties.
- c. It shall be unlawful to color, dye, stain or otherwise change the natural color of baby chickens or other fowl or rabbits.
- d. It shall be unlawful for any person to tether any fowl.
- e. It shall be unlawful to restrain any animal except in a humane fashion as set forth in Section 4-37 above and Section 4-41 below. (Does not apply to Chapel Hill and Carrboro)
- f. It shall be unlawful for any person to entice or lure any animal out of an enclosure or off the property of its owner or keeper, or to seize, molest or tease any animal while the animal is held or controlled by its owner or keeper or while the animal is on or off the property of its owner or keeper, except a stray animal may be seized when trying to capture it.
- g. It shall be unlawful to possess any paraphernalia related to dog, cock or other animal fighting, ~~including, but not limited to, gaffs.~~ with the intent that the paraphernalia be used to train or feature in an exhibition the baiting of dog, cock or other animal or the fighting of a dog, cock or other animal with another dog, cock or other animal.
- h. It shall be unlawful for any person to transport an animal in the closed trunk of a vehicle, or closed compartment on a vehicle or trailer when the ambient temperature in the vicinity of the vehicle or trailer is greater than or equal to 70 degrees F.
- i. It shall be unlawful for any person to commit any of the acts made unlawful under the provisions of North Carolina General Statutes §§ 14-360 and 14-362, as the same relate to a dog or dogs, or to commit any other act made unlawful by any other law of the State of North Carolina relating to animal fighting or animal baiting. The repeal of such law or laws of the State of North Carolina shall have no effect upon this Section, and the acts herein made unlawful shall, in the event of such repeal, be those referred to in said law or laws immediately prior to such repeal.

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- j. It shall be unlawful for any person to abandon or forsake any animal within the County.
- k. It shall be unlawful for any person to restrain a dog using a chain, wire or other type of tethering device in a manner prohibited by this subsection. (Does not apply in Chapel Hill or Carrboro)
 - (1) No person shall tether, fasten, chain, tie, or restrain a dog, or cause such restraining of a dog, to a tree, fence, post, dog house, or other stationary object for more than a total of three hours in a 24-hour period. During periods of tethering that are not unlawful under this subsection, any tethering device used shall be at least ten feet in length and attached in such manner as to prevent strangulation or other injury to the dog and entanglement with objects. In no event shall the time limitations established by this subsection 4-41(k)(1) & (2) below be added together to allow for tethering, fastening, chaining, tying, or restraining to either a stationary object or to a cable trolley system for more than a total of three hours in a 24-hour period.
 - (2) No person shall tether, fasten, chain, tie, or restrain a dog, or cause such restraining of a dog, to a cable trolley system, that allows movement of the restraining device, for more than a total of three hours in a 24-hour period. During periods of tethering that are not unlawful under this subsection, the length of the cable along which the tethering device can move must be at least ten feet, and the tethering device must be of such length that the dog is able to move ten feet away from the cable perpendicularly and attached in such a manner as to prevent strangulation or other injury to the dog and entanglement with objects.
 - (3) No person shall tether a dog with a chain or wire or other device to, or cause such attachment to, any collar other than a buckle type collar or body harness.
 - (4) No person shall tether with a chain or wire or other device to, or cause such attachment to, a head harness, choke-type collar or pronged collar to a dog.
 - (5) No person shall tether with a chain, wire or other device to a dog where the weight of the tethering device and the collar combined exceeds ten percent of the dog's body weight.
 - (6) No person shall tether with a chain or wire or other device a dog in such manner that does not allow the dog access to adequate food, water, and shelter.
 - (7) Notwithstanding the provisions of subsections 4-41(k)(1) & (2) of this subsection, a person may, subject to the provisions of subsections 4-41(k)(3)—

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(6), and subject to the requirement that any stationary tethering device used shall be at least ten feet in length, and subject to the requirement that for any cable trolley system used the length of the cable along which the tethering device can move must be at least ten feet, and the tethering device must be of such length that the dog is able to move ten feet away from the cable perpendicularly:

- a. Tether and restrain a dog while actively engaged in:
 - i. Use of the dog in shepherding or herding livestock, or
 - ii. Use of the dog in the business of cultivating agricultural products, if the restraining is reasonably necessary for the safety of the dog, or
 - iii. Use of the dog in lawful hunting activities if the restraint is reasonably necessary for the safety of the dog, or
 - iv. Use of the dog at dog training or performance events, including but not limited to field trials and obedience trials where tethering does not occur for a period exceeding seven consecutive days, or
 - v. Camping or other recreation where tethering is required by the camping or recreational area where the dog is located, or
 - vi. Any activity where a tethered dog is in visual range of its Owner or Keeper, and the Owner or Keeper is located outside with the dog.
- b. After taking possession of a dog that appears to be a stray dog and after having advised animal control authorities of the capture of the dog, tether and restrain the dog in accordance with the provisions of Section 4-41 for a period not to exceed seven days as the person having taken possession of the dog is seeking the identity of the owner of the dog.
- c. Walk a dog with a handheld leash.
- d. Section 4-41 becomes effective one year following the adoption of this amendment (the "effective date"). Any person who violates this subsection after the effective date but prior to the expiration of the eighteenth month following the date this amendment was adopted shall be issued a written warning giving the violator notice of the provisions of this amendment. Any person who violates Section 4-41 after the expiration of the eighteenth month following the date of the adoption of this amendment is subject to one or more of the Penalties established in Section 4-51 of this Ordinance. Any dog that is kept in violation of Section 4-41 of this Ordinance may be seized and subsequently impounded in accordance with Section 4-43 of this

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Ordinance until such a time as the Animal Control Services Director is reasonably assured that the dog will not be subject to restraint in violation of this Ordinance. The Animal Control Services Director shall post a notice at the place of the illegal restraint, or at such other location, that is designed to reasonably apprise the Owner or Keeper of the dog, the place, date and time the dog was seized along with the location where the dog was taken. Such notice shall clearly state that the dog may be returned to the Owner or Keeper upon providing reasonable assurances to the Animal Control Services Director that the dog will not be subject to restraint in violation of this Ordinance.

(Ord. of 6-16-1987, § XI, eff. 1-1-88; Amend. of 11-18-2008, eff. 11-19-09)

Sec. 4-42. - Control of vicious animals; security dogs.

- (a) In General. It shall be unlawful for any person to keep any vicious animal within the County, unless under restraint and on the premises of the owner or keeper. ~~Security dogs are subject to all other provisions of this Ordinance while off the premises of their owner or keeper.~~
- (b) Vicious Animal. Any animal, ~~security dog excluded,~~ on or off the premises of its owner or keeper, which is three (3) months of age or older and ~~who~~ which:
- (1) Without provocation has bitten, killed or caused physical harm through bite(s) to a person; or
 - (2) Without provocation has attempted to bite a person or cause physical harm through bite(s) to a person; or
 - (3) Without provocation has injured, maimed or killed a pet or domestic livestock, except where such animal has bitten or killed an animal a pet or domestic livestock that is not where is its (their) owner(s) have been told such animal(s) cannot be trespassing on the land of another without permission or is defending a person; or
 - (4) Has been deemed potentially dangerous or dangerous in accordance with N.C. Gen. Stat. Chapter 67, Article 1A. Dangerous Dog.
- (c) Declaration of Vicious Animal.
- (1) Upon observation by an Animal Control or law enforcement officer or receipt of a written complaint that an animal is behaving or has behaved viciously and is at large or is off the premises of its owner or keeper and is not restrained by a competent person, an Animal Control Officer may impound the animal and investigate the complaint and, upon a finding that there is probable cause to believe a violation of this Ordinance or other applicable law or regulation has

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occurred, shall take any action allowed by this Ordinance or State law as the circumstances may require.

- (2) Any animal who, after investigation by an Animal Control officer, is found by the Animal Services Director to have committed any act described in (b) above may, in the Animal Services Director's sole discretion, be declared vicious and is subject to this Section of the Ordinance.

(d) Effect of Declaration.

- (1) Permitted Locations. A vicious animal shall be permitted at the following locations only:

- (a) On the premises of the owner or keeper either confined indoors or in a secure enclosure when outdoors;

- i. Secure Enclosure. The owner or keeper of a declared vicious animal is required to keep the animal securely confined indoors or in a securely enclosed and locked pen or structure. The pen or structure must be suitable to prevent the entry of young children and designed to prevent the animal from escaping; it must provide the animal with protection from the elements; and must be inspected by an animal control officer and approved by the Animal Services Director prior to use by the animal declared vicious.
- ii. Annual Inspection. An Animal Control Officer shall inspect the secured enclosure of all animals deemed vicious at least once a year to assure that the standards are maintained. There will be an inspection fee as provided by the Orange County Board of Commissioners.

- (b) On private property, with the authorization of the owner of the property;

- (c) At a licensed veterinarian for treatment;

- (d) In a motor vehicle while being transported;

- (e) Off the owner's or keeper's property provided it is muzzled and controlled by means of a chain, leash or other like device by a competent adult able to restrain the animal.

- (2) When going to and from a Permitted Location or a Secured Enclosure an animal declared vicious off the owner's or keeper's property must be muzzled and controlled by means of a chain, leash or other like device by a competent adult able to restrain the animal.

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- (3) There must be posted on the premises of the owner or keeper placards or signs noting "Beware of Dog" or other information noting the presence of a vicious animal placed in a manner reasonable likely to come to the attention of an intruder.
- (4) Any animal declared vicious must receive a microchip prior to the animal being reclaimed if impounded. If the animal was not impounded and it is declared vicious the owner must provide proof to animal services that the animal has received a microchip within 30 days of having received notice that the dog has been declared vicious.
- (e) Exceptions. The provisions of this Section do not apply to:
 - (1) A dog being used by a law enforcement officer to carry out the law enforcement officer's official duties;
 - (2) A dog being used in a lawful hunt;
 - (3) A dog where the injury or damage inflicted by the dog was sustained by a domestic animal while the dog was working as a hunting, herding or predator control dog on the property of, or under the control of, its owner or keeper, and the damage or injury was to a species or type of domestic animal appropriate to the work of the dog; or
 - (4) A dog where the injury inflicted by the dog was sustained by a person who, at the time of the injury was:
 - a. On the owner's or keeper's property that has been posted with placards or signs noting the presence of such animal or "No Trespassing" in a manner reasonably likely to come to the attention of an intruder;'
 - b. Committing a willful trespass or other, which shall be determined by looking at the totality of the circumstances;
 - c. Tormenting, abusing, or assaulting the dog or has attempting to torment, abuse, or assault the dog; or
 - d. Committing or attempting to commit a crime.
 - (5) Security dogs are subject to all other provisions of this Ordinance while off the premises of their owner or keeper.
- (f) An animal which has been declared vicious may be impounded by the Animal Control Officer, either upon direct observation of the Animal Control Officer or law enforcement officer or receipt of written complaint that the animal is at large, or off

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the premises of its owner or keeper and not restrained by a competent person, or not confined in a manner permitted in subsection (d) above.

- (1) Written Complaint. Upon receipt of a written complaint that an animal ~~is or has been was behaving viciously or was~~ previously declared vicious was off the owner or keeper property while not properly restrained and there is probably cause to believe a violation of this Ordinance or other applicable law or regulation has occurred, an Animal Control Officer may impound the animal and investigate the complaint.
- (2) If an animal is impounded as vicious, authorization for reclamation after any required holding period shall be granted when in the sole discretion of the Animal Services Director, or their designee, they are reasonably assured that either the animal is not vicious or the vicious animal will be properly restrained on the premises of its owner or keeper.
- (3) Upon a finding that there is probable cause to believe a violation of this Ordinance or other applicable law or regulation has occurred, the Officer may seize the animal and take any action allowed by this Ordinance or State law as the circumstances may require.
- (g) Citation. The Animal Control Officer shall issue a citation to the owner or keeper for actions described in section b. 1 - 4. Citations may be delivered in person or by registered mail if the owner or keeper is not readily found. The citation issued shall impose upon the owner or keeper a civil penalty of one hundred dollars (\$100.00), or any other amount prescribed by the Orange County Board of Commissioners.
 - (1) The violator must pay the citation to the Orange County Animal Services within fourteen (14) days of receipt in full satisfaction of the assessed civil penalty. This penalty is in addition to any other fees or remedies authorized under this Chapter.
 - (2) In the event that the owner or keeper of the animal does not appear in response to the described citation, the civil penalty is not paid within the time period prescribed, or if the animal previously has been declared vicious upon payment of a citation or the conviction of the owner or keeper a criminal summons may be issued against the owner or keeper for violation of this chapter and upon conviction, the owner or keeper shall be punished as provided by this Ordinance.
 - (3) Upon the issuance of a citation for an animal which has committed any of the acts described in this Section, the animal must be confined either in the home of the owner or keeper, at an animal shelter, a kennel as provided in Sections 4-71 and 4-72 below or a veterinarian's office until such time that the required pen is constructed, the animal is destroyed, or a judge finds that the animal is not a vicious animal.

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- (4) The Animal Services Director has the authority at any time to require that a vicious animal not be kept in the owner's or keeper's home. The animal must stay confined through any legal appeals. The owner or keeper shall be responsible for the costs incurred in the animal's confinement. If the animal is found not to be a vicious animal, the County shall be responsible for the cost of animals kept at the Animal Services facility for that purpose.

(h) Effect of Citation.

- (1) Upon payment of a citation or the conviction of the owner or keeper for having an animal which without provocation has committed any of the acts described in subsection (b) above, said animal is declared a vicious animal.
- (2) Upon the payment of a citation or the conviction of the owner or keeper for having an animal which on or off the property of the owner or keeper and without provocation has killed or caused life threatening injuries through bite(s) to a person, the animal will be seized by the animal control officer and destroyed in a humane manner.
- (3) Any animal previously declared vicious upon the payment of a citation or by conviction of the owner or keeper for a violation of this subsection, that commits a subsequent violation of the subsection, will cause the owner or keeper to be charged with that violation. Upon the owner or keeper's conviction of that violation, the animal will be destroyed in a humane manner.
- (4) Any violation of this section may be a misdemeanor and subject to a fine of five hundred dollars (\$500.00) or imprisonment of not more than thirty (30) days.
- (5) All persons owning security dogs that are classed as patrol dogs or sentry dogs as defined by this Ordinance shall register such animals with the Animal Services Director; the owner or keeper of any such dog that is classed as a patrol dog or sentry dog under this Ordinance shall place signs or placards on his premises noting "Beware of Dog" or other information noting the presence of security dog(s).
- (j) Appeal. Any declaration that an animal is "vicious" may be appealed to the Orange County Animal Services Advisory Board as provided in this Chapter.

Sec. 4-43. - Impoundment of animals.

Any animal found at large, found not to be wearing a currently valid rabies tag, has been declared vicious and is outside not in a secure pen or on a restraint, that is a danger to the public or for any other reason designated in this Chapter is a public nuisance and may be impounded and confined in the Animal Shelter in a humane manner for a period hereinafter prescribed:

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- (a) Owner notification. Immediately upon impounding any animal, the Animal Services Director or designee shall attempt to notify the owner or keeper by either telephone or in person to inform that person of such impoundment, and the conditions whereby the animal may be redeemed. If unable to give notice by telephone, an official, dated, written notice shall be mailed to the registered owner by certified mail, return receipt requested, giving notice of the impoundment and the conditions whereby the animal may be redeemed.
- (b) Reclamation. A domesticated animal impounded under this Chapter may be reclaimed by its owner or keeper according to procedures of Animal ~~Control~~ Services. The owner or keeper of an impounded domesticated animal shall be responsible for and shall pay all expenses, boarding costs, redemption privilege taxes and costs associated with such impoundment prior to reclaiming the animal. Unless reclaimed, the impounded domesticated animal may be allowed to be adopted or humanely euthanized according to Animal ~~Control~~ Service procedures after five days of impoundment. Feral dogs and cats may be held for 72 hours and then euthanized pursuant to Animal ~~Shelter~~ Services procedures for humane euthanasia. The owner or keeper of an impounded domesticated animal shall also comply with any vaccination and licensing directives and be responsible for the payment to Orange County of all civil penalties and license privilege taxes imposed or associated with the animal's impoundment as prescribed in any citation or notice issued by the Animal ~~Control~~ Services Director. Animals who have impounded in accordance with N.C. Gen. Stat. 130A-196, after having bitten a person not reclaimed within 72 hours after the end of the quarantine period will be considered abandoned and will become the property of the Orange County and disposed of according to standard Animal ~~Shelter~~ Services procedures.
- (c) Release to Owner. An owner of an impounded animal may reclaim the animal after it has been impounded, upon compliance with this Section and in accordance with requirements set forth by the Animal Services Director. Nothing in this Chapter shall require the Animal Services Director to release an animal that has been impounded that is need of protection because of cruel treatment.
- (d) Diseased or injured animals. Severely diseased or badly injured animals may be euthanized in a humane manner, if authorized by a licensed veterinarian, without waiting the required redemption or adoption period.
- (e) Confinement Order. In lieu of impoundment, the Animal ~~Control~~ Services Director is authorized to issue a Confinement Order to the animal owner or keeper that would require the owner or keeper to confine a vicious animal or an animal otherwise violating provisions of the Ordinance. Failure to thus confine the animal would constitute a further violation of the Ordinance, subjecting the owner to appropriate criminal or civil penalties.

(Ord. of 6-16-1987, § XIII, eff. 1-1-88; Amend. of 12-2-96, eff. 1-1-97)

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Sec. 4-44. - Handling of stray animals.

It shall be unlawful for any person, without the consent of the Owner or Keeper, knowingly and intentionally to harbor, feed, keep in possession by confinement or otherwise any animal that does not belong to him, unless he has, within 72 hours from the time such animal came into his possession, notified ~~an Animal Control Officer or the Animal Shelter~~ Services.

- (a) Any animal at large may in a humane manner be seized, impounded, and confined in the Animal Shelter and thereafter adopted out or disposed of pursuant to procedures of ~~the~~ Animal ~~Shelter~~ Services and applicable State law.
- (b) Impoundment of such an animal shall not relieve the owner or keeper thereof from any penalty which may be imposed for violation of this ~~Ordinance~~ Chapter.
- (c) Any animal seized and impounded that is badly wounded or diseased and has no identification, may be euthanized pursuant to procedures of ~~the~~ Animal ~~Shelter~~ Services. If the animal has rabies or is suspected of having rabies, the body shall be disposed of in accordance with applicable state regulations. If the animal has identification, ~~the~~ Animal ~~Shelter~~ Services shall attempt to notify the owner or keeper before euthanizing such animal; in any event, and except as may be otherwise provided by law, ~~the~~ Animal ~~Shelter~~ Services and ~~Animal Control Program~~ shall have no liability for euthanizing wounded or diseased animals when such action is taken upon the advice or recommendation of a veterinarian who has been advised of the animal's condition.
- (d) Any cat or dog impounded must receive a microchip, at the expense of its owner, prior to recovery by its owner.

(Ord. of 6-16-1987, § XIV, eff. 1-1-88)

Sec. 4-45. - Public nuisance.

- (a) In General. It shall be unlawful for an owner or keeper to permit an animal or animals to create a public nuisance, or to maintain a public nuisance created by an animal or animals. ~~Compliance shall be required as follows:~~
- (b) Prima Facie Evidence. Actions deemed prima facie evidence of a public nuisance include the following activities of any animal, or conditions maintained or permitted by the animal's owner or keeper:
 - (1) Habitually or repeatedly, without provocation, chasing, snapping at or attacking pedestrians, bicycles, persons lawfully entering the property to provide a service, other animals being walked on a leash, or vehicles even if the animal never leaves the owner's property, except that this provision shall not apply if such animal is restrained by a pen, fence, or other secure enclosure. For purposes of this section, an "underground fence" shall only be considered secure if it in fact contains the animal and a small sign or other notification is present to alert others that the animal is

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restrained.

- (2) Interfering with the reasonable use and enjoyment by neighboring residents of their property because of its odor or excessive noise making. For purposes of this subsection, excessive noise making shall include repeated episodes of barking, howling, whining, crying, or crowing only if the rooster is within the town limits or Carrboro, Chapel Hill, or Hillsborough.
- (3) A female dog that is not confined while in heat in a building or secure enclosure in such a manner that she will not be in contact with another animal, provided that this section shall not be construed to prohibit the intentional breeding of animals within an enclosed area on the premises of the owner or keeper of an animal involved in the breeding process.
- (4) Damages the property of anyone other than its owner or keeper, including but not limited to, turning over garbage containers or damaging gardens, flowers, shrubbery, vegetables or trees, fences or gates, or causing injury to domesticated livestock or pets.
- (5) Without provocation, inflicts on any person a serious injury requiring treatment by a physician, including but not limited to a bite or scratch that breaks the skin.
- (6) Any large animal off the premises of the owner or keeper; except in the case of domestic livestock the Animal Services Director, or their designee, shall have the discretion to determine a violation when the animal, in their judgment, presents a danger to the public, is destroying or damaging property, is violating property rights, or has been habitually at large.
- (7) The provisions of subsections (1) through (5) above of this section shall not apply to cats. However, a cat may be deemed a public nuisance when off the premises of its owner or keeper when it:
 - i. Habitually or repeatedly defecate or urinate in children's sandboxes, gardens, flower beds or other private property without the permission of the property owner;
 - ii. Habitually or repeatedly injure or kill animals or birds, whether domesticated or not;
 - iii. Is a female in heat not confined in a building or secure enclosure in such a manner as to prevent contact with another cat;
 - iv. Habitually or repeatedly, without provocation, chases or attacks pedestrians, bicyclists or other animals being walked on a leash;
 - v. Seriously interferes with the reasonable use and enjoyment by neighboring

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residents of their property because of its howling, whining, crying, or other noise making;

- vi. Without provocation, inflicts on any person a serious injury requiring treatment by a physician, including but not limited to a bite or scratch that breaks the skin.
- vii. Habitually or repeatedly walks or sleeps on or damages vehicles owned by another.
- viii. Is off the owner's or keeper's property except when the cat can be identified through a currently registered microchip.

(8) Subsection (7)(viii) applies also to ferrets.

(c) Violation.

(1) Determining Violations.

- i. Animal Control or Law Enforcement Officer. An Animal Control Officer or law enforcement officer who observes a violation, of this section, shall provide the owner or keeper of the animal written notification of the nature of the violation(s) in the form of an Abatement Order that shall indicate that unless these violations are abated and measures are taken to prevent their reoccurrence within twenty-four (24) hours or such lesser time as the designated in the notice, the owner shall be required to remove the animal from the County.
- ii. Written Complaint.
 - 1. Upon receipt of a written detailed and signed complaint alleging that any person is maintaining a public nuisance as defined in this Ordinance, the Animal Services Director shall cause the owner or keeper of the animal or animals in question to be notified that a complaint has been received, and shall cause the situation complained upon to be investigated and a written report thereon to be prepared.
 - 2. If the written findings indicate that the complaint is justified, the Animal Services Director shall provide the owner or keeper of the animal written notification of the nature of the violation(s) in the form of an Abatement Order that shall indicate that unless these violations are abated and measures are taken to prevent there reoccurrence within twenty-four (24) hours or such lesser time as the designated in the notice, the owner shall be required to remove the animal from the County.

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- (2) Failure to Abate a Violation. If the public nuisance has not been abated after the time indicated in the Abatement Order, then the Animal Service Director shall, notify the owner or keeper in writing that the animal may be impounded or a civil penalty may be issued and/or a criminal summons may be issued.
- (3) Animals Removed from County. The Owner or Keeper of any animal who has been required to remove the animal pursuant to this Section shall, within five (5) days after removal, inform the Administrator or designee in writing of the animal's present location, including the name, address and telephone number of the animal's owner or keeper. If the animal has been destroyed, the Administrator shall be informed of the name, address, and telephone number of the person who destroyed such animal.
- (4) Subsequent Violations. The Animal Services Director or designee may impound an animal if a third verified violation occurs within one year of any other previous violations of this Section.
- (5) Right of Appeal. An Owner or Keeper shall have a right to appeal a citation or removal of an animal under this Section in accordance with Section 4-54 of this Chapter.

Sec. 4-46. - Rabies control.

It shall be unlawful and a violation of this Ordinance for any animal owner, keeper or other person to fail to comply with the laws of North Carolina relating to the control of rabies.

(Ord. of 6-16-1987, § XVI, eff. 1-1-88)

Sec. 4-47. - Rabies vaccination tag.

All dogs ~~and cats~~ shall wear a valid rabies vaccination tag. Cats and ferrets are not required to wear tags but the owner or custodian of such animal shall provide proof that the cat or ferret has been vaccinated against rabies. The owner or custodian of all animals required to be vaccinated against rabies shall provide proof of vaccination upon demand of a law enforcement or animal control officer if an animal required to be vaccinated is not wearing a rabies vaccination tag. Failure to produce proof of vaccination may result in such animal being impounded subject to redemption in the manner provided in this Chapter. Such proof being the certificate of vaccination from a licensed veterinarian or a certified rabies vaccinator.

(Ord. of 6-16-1987, § XVII, eff. 1-1-88; Amend. of 12-2-1996, eff. 1-1-97)

Sec. 4-48. - Applicability to veterinarians.

Hospitals, clinics and other premises operated by licensed veterinarians for the care and treatment of animals are exempt from the provisions of this Ordinance except for the provisions relating to cruelty to animals and rabies control.

(Ord. of 6-16-1987, § XVIII, eff. 1-1-88)

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Sec. 4-49. - Reserved.

Editor's note—

Section 4-49 entitled kennel standards replaced by Sections 4-71 and 4-72 and derived from Ord. of 6-16-1987, § VIII, eff. 1-1-88; Amend. of 12-3-2007, eff. 7-1-08.

Sec. 4-50. - Reserved.

Editor's note—

Section 4-50 entitled permits and standards for animal collection replaced by Sections 4-96 through 4-99 and derived from Ord. of 6-16-1987, § XX, eff. 1-1-88; Amend. of 12-3-07, eff. 7-1-08.

Sec. 4-51. - Penalties.

The following penalties shall pertain to violations of this Ordinance.

- (a) The violation of any provision of this Ordinance shall be a misdemeanor and any person convicted of such violation shall be punishable as provided in North Carolina General Statutes § 14-4, or other applicable law. Each day's violation of this Ordinance is a separate offense. Payment of a fine imposed in criminal proceedings pursuant to this subsection does not relieve a person of his liability for taxes, fees or civil penalties imposed under this Ordinance.
- (b) Enforcement of this Ordinance may include any appropriate equitable remedy, injunction or order of abatement issuing from a court of competent jurisdiction pursuant to North Carolina General Statutes § 153A-123 (d) and (e).
- (c) In addition to and independent of any criminal penalties and other sanctions provided in this Ordinance, a violation of this Ordinance may also subject the offender to the civil penalties hereinafter set forth.
 - (1) The Animal Services Director (or designee) may issue to the known owner or keeper of any animal, or to any other violator of the provisions of this Ordinance, a ticket or citation giving notice of the alleged violation(s) and of the civil penalty imposed. Tickets or citations so issued may be delivered in person or mailed by first class mail to the person charged if that person cannot readily be found. The following civil penalties shall be assessed for each violation of this Ordinance.
 - (i) Mistreatment of Animals (Section 4-41) \$200.00
 - (ii) The civil penalty for a nuisance violation (Section 4-45) shall be as follows:

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| Number of Prior Nuisance Violations | Amount |
|-------------------------------------|-----------------|
| 1 | <u>\$100.00</u> |
| 2 | <u>\$200.00</u> |
| 3 or more | <u>\$400.00</u> |

(2) This civil penalty shall be paid to the Animal Services Director or his or her designee within 14 days of receipt. This civil penalty is in addition to any other fees, taxes, costs or fines imposed that are authorized by this Ordinance.

(3) In the event that the applicable civil penalty is not paid within the time period prescribed, a civil action may be commenced to recover the penalty and costs associated with collection of the penalty, and/or a criminal summons may be issued against the owner or keeper or other alleged violator of this Ordinance, and upon conviction, the owner shall be punished as provided by State law. Failure on the part of the owner or keeper of an animal or other alleged violator to pay the applicable civil penalty within the time period prescribed is unlawful and a violation of the Ordinance. Unless otherwise provided The civil penalty for violation of this subsection is \$25.00, except where the original violation was for Failure to Vaccinate for Rabies in which case the civil Penalty for violation of this subsection is \$100.00.

(Ord. of 6-16-87, § XXI, eff. 3-15-88; Amend. of 12-3-07, eff. 7-1-08)

Sec. 4-52. - Severability.

If any part of this Ordinance shall be held invalid, such part shall be deemed severable and the invalidity thereof shall not affect the remaining parts.

(Ord. of 6-16-1987, § XXII, eff. 1-1-88)

the foregoing Animal Control Ordinance was adopted this the 16th day of June, 1987. This Ordinance was amended effective

(Ord. of 6-16-1987, § XXIII, eff. 1-1-88)

Sec. 4-54. - Appeals.

Any appeals of the Chapter shall be to a three member hearing panel comprised of two members of the Orange County Animal Services Advisory Board and one member of either Carrboro, Chapel Hill or Hillsborough so designated by the respective Town or a member of the public designated by the Board of County Commissioners for this purpose within 5 days of the final decision made in the action.

(a) A person who has been found to be in violation of this Chapter may appeal the violation by filing a notice of appeal containing a concise statement of the reason for the appeal and delivering it to the Animal Services Director.

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- (b) A hearing shall be scheduled within 10 days of the receipt of notice of appeal.
- (c) Neither a party nor the Department shall be represented by an attorney.
- (d) The presiding officer shall administer oaths to all witnesses and make any ruling necessary to preserve fairness, order and proper decorum.
- (e) A person appealing a decision may present evidence or testimony, cross-examine witnesses, inspect documents, and offer evidence or testimony in explanation or rebuttal.
- (f) Any member of the hearing panel may call as a witness and question any interested party who has competent, relevant and material comments about the matters contained within the appeal.
- (g) Members of the hearing panel may exclude and not factor into their decision any evidence, testimony, or statements deemed incompetent, irrelevant, immaterial or unduly repetitious and therefore fail to reasonable address the issues before the hearing panel.
- (h) Within seven days of the hearing the hearing panel shall issue a decision and cause that decision to forward to the person making the appeal and all other interested parties.

The Animal Services Advisory Board may make additional rules necessary to carry appeals in fair and equitable manner. (Does not apply in the Town of Carrboro)

Secs. 4-53—4-70. - Reserved.

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DIVISION 2. - KENNEL AND PET SHOP STANDARDS

Sec. 4-71. – Class I kennels.

- (a) In General. A noncommercial or not for profit establishment maintained by any person where animals of any species, excluding domesticated livestock, are kept for the purpose of showing, competition, hunting or sport, and which establishment is so constructed that the animals cannot stray therefrom, and which maintains more than six but less than 19 animals.
- (b) Standards for Class I Kennels. All noncommercial kennels shall, in addition to other requirements of this article, comply with the minimum standards of this section. ~~Owners or operators of class I kennels must apply to the animal control director, pay any designated privilege tax and receive a permit to own or operate a noncommercial kennel in the county. Facilities shall be subject to inspection during reasonable hours by the animal control officer upon his request. Failure to meet the standards set out in this section shall be grounds for the issuance of a citation subjecting the owner to the penalties described in this article, and/or the issuance of an abatement order to comply with the provisions of this article.~~ The premises at noncommercial kennels shall meet the following standards:
- (1) All enclosures housing animals must provide adequate shelter.
 - (2) The food shall be free from contamination, wholesome, palatable and of sufficient quantity and nutritive value to meet the normal daily requirements for the condition and size of the animal.
 - (3) All animals shall have fresh potable water available at all times.
 - (4) All areas housing animals shall be free of accumulated waste and debris and shall be maintained regularly so as to promote proper health.
 - (5) All areas housing animals shall be free of accumulated or standing water.
 - (6) All animals housed shall be provided with proper veterinary care to promote good health.
- (c) Owners or operators of class I kennels must apply to the Animal Services Director for a Class 1 Kennel Permit and pay any designated privilege tax to receive a permit to own or operate a noncommercial kennel in the county.
- (d) Kennel facilities shall be subject to inspection during reasonable hours by the animal control officer upon his request.
- (e) Failure to meet the standards set out in this section shall be grounds for the issuance of a citation subjecting the owner to the penalties described in this article, and/or the issuance of an abatement order to comply with the provisions of this article.

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- (f) Revocation. A permit issued in accordance with this section may be revoked by the Administrator after notice and hearing, for any reason that would have justified denial of the permit in the first instance or for violation of another section of the Chapter. If the Administrator denies or revokes a permit in accordance with this section, the owner or operator shall be notified of their right to appeal such decision in accordance with Section 4-54.

(Ord. of 6-16-1987, § XIX(B), eff. 1-1-1988)

Sec. 4-72. - Class II kennels.

- (a) In General. Any person maintaining any commercial establishment where animals of any species excluding domesticated livestock, kept for the purpose of breeding, buying, selling, grooming or boarding such animals or engaged in the training of dogs for guard or sentry purposes, and which establishment is so constructed that the animals cannot stray therefrom; or any person owning or keeping 20 or more animals, excluding domesticated livestock, each of which is four months of age or older.
- (b) Standards for a Class II Kennel. All commercial kennels shall, in addition to the other requirements of this article including those for a 4-71 above, comply with the minimum standards of this subsection. ~~Owners or operators of Class II kennels must apply to the animal control director, pay any designated fee, and receive a permit to own or operate a Class II commercial kennel in Orange County. Facilities shall be subject to inspection during reasonable hours by an animal control officer upon his or her request. A fee in the amount of \$25.00 shall be assessed against the owners or operators of a facility for failing to permit an inspection pursuant to this subsection in order to defray the costs of repeat travel to the facility. Failure to meet the standards set out herein shall be grounds for the issuance of a citation subjecting the owner to the penalties described herein, and/or the issuance of an abatement order to comply with the provisions of this article. The premises of commercial kennels shall meet the following standards:~~
- (1) Buildings or enclosures must be provided which shall allow adequate protection against extreme weather conditions. Floors of buildings, runs and walls shall be of a nonporous material or otherwise constructed as to permit proper cleaning and disinfecting. Temperatures in animal containments shall be maintained at a level that is healthful for every species of animal in the containment.
 - (2) Cages, kennels or runs shall have sufficient space for each animal to sit, stand up, lie down, turn around and stretch out to its full length without touching the sides or tops of the cage, kennel or run. Cages, kennels and runs are to be of a material and construction that permits cleaning and disinfecting, and shall have an impervious surface. Cage, kennel and run floors of concrete shall have a resting board or some type of bedding. Cages, kennels and runs shall provide protection from the weather. All animal quarters are to be kept clean, dry and in a sanitary condition. Cages, kennels and runs shall be structurally sound and maintained in

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good repair to protect animals from potential injury, contain the animals, and restrict the entrance of other animals and people.

- (3) Animals shall not be placed in cages, kennels or runs less such cages, kennels or runs are so constructed to prevent animal excreta from entering other cages, kennels or runs.
- (4) Sufficient shade shall be provided to allow all animals kept outdoors to protect themselves from the direct rays of the sun.
- (5) Each animal shall be given the opportunity for vigorous daily exercise as appropriate.
- (6) Litter boxes shall be provided for cats and kittens.
- (7) Food shall not be contaminated and shall be wholesome, palatable, and of sufficient quantity and nutritive value and offered at appropriate intervals to meet the normal daily requirements for the condition, size and age of the animal. Food for all animals shall be served in a clean container so mounted that the animals cannot readily tip it over or defecate or urinate in it.
- (8) Supplies of food and bedding shall be stored in facilities that adequately protect such supplies against infestation or contamination by vermin. Refrigeration shall be provided for supplies of perishable food.
- (9) All animals shall have fresh, potable water available at all times. Water containers shall be of a removable type and be mounted or secured so that the animals cannot readily tip them over or defecate or urinate in them.
- (10) All food and water containers shall be cleaned and disinfected daily.
- (11) All animals must be fed and watered, and all cages and kennels cleaned each day, including Sundays and holidays.
- (12) Adequate veterinary care shall be provided as needed for each animal.
- (13) Provisions shall be made for the removal and disposal of animal and food waste, bedding and debris.
- (14) Facilities such as a washroom, sink or basin shall be provided to maintain cleanliness among animal caretakers and animal food and water containers.
- (15) Facilities for animals shall be adequately ventilated to provide for the health and comfort of the animals at all times. Such facilities shall be provided with fresh air, either by means of windows, doors, vents or air conditioning, and shall be ventilated so as to minimize drafts, odors and moisture condensation.

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- (16) Facilities for animals shall have ample light by natural or artificial means or both, of good quality and well distributed and as appropriate for each animal's health and well-being. Such lighting shall provide uniformly distributed illumination of sufficient light intensity to permit routine inspection and cleaning during the entire working period. Enclosures shall be so placed as to protect the animals from excessive illumination.
- (17) Every person maintaining such a facility shall post a notice clearly visible from the ground level at the main entrance to the facility containing the names, addresses and telephone numbers of persons responsible for the facility where they may be contacted during any hour of the day or night.
- (c) Owners or operators of Class II kennels must apply to the Animal Services Director for a Class II Kennel Permit, pay any designated fee, to receive a permit to own or operate a Class II Kennel in Orange County.
- (d) Kennel Facilities shall be subject to inspection during reasonable hours by an animal control officer upon his or her request. A fee in the amount of \$25.00 shall be assessed against the owners or operators of a facility for failing to permit an inspection pursuant to this subsection in order to defray the costs of repeat travel to the facility.
- (e) Failure to meet the standards set out herein shall be grounds for the issuance of a citation subjecting the owner to the penalties described herein, and/or the issuance of an abatement order to comply with the provisions of this article.
- (f) No person may own or operate a Class II Kennel within the County unless and until such person satisfies the requirements of this section and has been issued any privilege license if required.
- (g) A permit issued in accordance with this section may be revoked by the Administrator after notice and hearing, for any reason that would have justified denial of the permit in the first instance or for other violations of this Chapter. If the Administrator denies or revokes a permit in accordance with this section, the owner or operator shall be notified of their right to appeal such decision in accordance with Section 4-54.

(Ord. of 6-16-1987, § XIX(A), eff. 1-1-1988; Amend. of 12-3-2007, eff. 7-1-2008)

Sec. 4-73. - Pet shops.

- (a) In general. A person that acquires for the purposes of resale animals, excluding domesticated livestock, bred by others whether as owner, agent, or on consignment, and that sells, trades or offers to sell or trade such animals at retail or wholesale, or a person that holds or keeps animals, excluding domesticated livestock, for the purpose of cleaning or grooming.

Animal Control Ordinance

(b) Standards for Pet Shops. All pet shops, including pet shops run in conjunction with another animal facility, shall, in addition to the other requirements of this article, comply with the minimum standards of this section. ~~Failure to meet these standards shall be grounds for the issuance of a citation subjecting the owner to the penalties described in this article, and/or the issuance of an abatement order to comply with the provisions of this article. Owners or operators of pet shops must apply to the animal control director, pay any designated privilege tax and receive a permit to own or operate a pet shop in the county. Facilities shall be subject to inspection during reasonable hours by the animal control officer or other appropriate representative of the animal control officer or other appropriate representative of the animal protection program upon his request. The~~ premises for pet shops shall meet the following standards:

- (1) There shall be available hot water at a minimum temperature of 140 degrees Fahrenheit for washing cages and disinfecting, and cold water easily accessible to all parts of the shop.
- (2) Fresh water shall be available to all species at all times. Containers are to be cleaned and disinfected each day. All water containers shall be removable for cleaning and be mounted so the animal cannot turn them over or defecate in them.
- (3) The temperature of the area around the animal enclosures in the shop shall be maintained at a level that is healthful for every species of animals kept in the shop.
- (4) All cages and enclosures are to be of a nonporous material for easy cleaning and disinfecting. Each cage must be of sufficient size that the animal will have room to stand, turn, lie down and stretch out to its full length without touching the sides or tops of the enclosure, and floors of sufficient strength and design to ensure the animal's limbs or paws cannot pass through the floor material.
- (5) All animals under three months of age are to be fed at least two times per 24 hours. Food for all animals shall be free from contamination, wholesome, palatable and of sufficient quantity and nutritive value to meet the normal daily requirements for the condition and size of the animal. Food for all animals shall be served in a clean dish so mounted that the animal cannot readily tip it over, and shall be of the removal type.
- (6) Each bird must have a perch and sufficient room to sit on a perch. Perches shall be placed horizontal to each other in the same cage. Cages and perches must be cleaned every day, and cages must be disinfected when birds are sold or as otherwise transferred. Parrots and other large birds shall have separate cages from smaller birds.

Animal Control Ordinance

- (7) There shall be sufficient clean, dry bedding to meet the needs of each individual animal. Provision shall be made for the removal and disposal of animal and food waste, bedding and debris, to ensure the enclosure is maintained in a clean and sanitary manner.
- (8) All animals must be fed and watered and all cages cleaned every day, including Sundays and holidays.
- (c) Failure to meet these standards shall be grounds for the issuance of a citation subjecting the owner to the penalties described in this article, and/or the issuance of an abatement order to comply with the provisions of this article.
- (d) Owners or operators of pet shops must apply to the Animal Services Director for a Pet Shop Permit, pay any designated privilege tax and receive a permit to own or operate a pet shop in the county.
- (e) Facilities shall be subject to inspection during reasonable hours by the animal control officer or other appropriate representative of the animal control officer or other appropriate representative of the animal protection program upon his request.
- (f) No person may own or operate a Pet Shop within the County unless and until such person satisfies the requirements of this section and has been issued any privilege license if required.
- (g) A permit issued in accordance with this section may be revoked by the Administrator after notice and hearing, for any reason that would have justified denial of the permit in the first instance or for other violations of the Chapter. If the Administrator denies or revokes a permit in accordance with this section, the owner or operator shall be notified of their right to appeal such decision in accordance with Section 4-54.

(Ord. of 6-16-1987, § XIX(C), eff. 1-1-1988)

Sec. 4-74 - Permit procedures.

The Animal Services Director shall establish procedures to govern the permitting process.

Secs. 4-74—4-95. - Reserved.

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DIVISION 3. - ANIMAL COLLECTION

Sec. 4-96. - Permit required.

A permit for the collecting of dogs and cats for sale shall be required before any individual may engage in any action in the county in furtherance of any action involving or relating to the collection or procurement of dogs and cats for sale or disposal. A permit allowing such actions will be issued only upon payment of a privilege tax set by the board of commissioners and demonstration by the applicant that the requirements of this division shall be met.

(Ord. of 6-16-1987, § XX(A)(Preamble), eff. 1-1-1988)

Sec. 4-97. - Permit application.

- (a) An application for a collection permit shall be made by each individual involved in the collecting of dogs and/or cats in the county for the purpose of sale or other disposal. Any such application for the purpose mentioned in this section shall have to be made to the Animal Services Director on a form prescribed by the Animal Services Director.
- (b) An investigation may then be conducted by the Animal Services Director which may include inspection of the premises where the animals are to be kept and any vehicles in which animals are to be transported. A fee in the amount of \$25.00 shall be assessed against an applicant or permit holder for failing to permit an inspection pursuant to this subsection in order to defray the costs of repeat travel.
- (c) Upon the determination by the Animal Services Director or person duly authorized by the Animal Services Director that the requirements of this section have been met and are capable of continuing to be met during the duration of the permit, a permit for no more than one year shall be issued, upon payment of applicable privilege taxes, to the individual applicant only for the specific individual applicant, premises and vehicles listed on the application.
- (d) Application for a permit renewal is the responsibility of the permit holder and shall be made no later than 30 days prior to the expiration of the current permit. Failure to reapply prior to the 30-day limit may result in a civil penalty.
- (e) No individual shall be issued a collection permit unless:
 - (1) The individual is properly licensed by the U.S. Department of Agriculture and/or the state department of agriculture, and such license is unsuspended and unrevoked.
 - (2) The individual complies with this article and all other applicable laws and regulations.

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- (3) All requirements of this section have been met.
- (4) The following information shall be provided on or with the application for a collection permit:
 - i. The name, address and telephone number of the applicant.
 - ii. U.S. Department of Agriculture and/or state department of agriculture license number under which the applicant operates.
 - iii. A basic description of the applicant's background, including but not limited to all licenses he may have had for handling or keeping of animals, and all arrests or convictions involving any matter or law in any way pertaining to animals.
 - iv. A complete description, including vehicle identification number and vehicle license number of each vehicle that will be used to collect and/or transport animals.
 - v. The address and location where the animals will be kept or maintained for the five days after collection.

(Ord. of 6-16-1987, § XX(A)(1), eff. 1-1-1988; Amend. of 12-3-2007, eff. 7-1-08)

Sec. 4-98. - Permit requirements.

No permit shall be issued or remain valid unless the Animal Services Director or person duly authorized by the Animal Services Director is satisfied that both the vehicles in which the animals will be collected and transported and/or the premises where the animals will be housed meet the following requirements:

- (1) *Premises.* All premises shall meet the same standards as set for class II commercial kennels in [section 4-72](#)
- (2) *Vehicles.*
 - a. Vehicles used to transport animals must be mechanically sound and equipped to provide fresh air to all animals without harmful drafts.
 - b. The sections of the vehicles where the animals are placed are to be constructed and maintained so that engine exhaust fumes cannot get to the animals.
 - c. The sections of the vehicles where the animals are to be kept should be cleaned and disinfected after each use and as needed.
- (3) *Enclosures in or on vehicles.*
 - a. Enclosures, including compartments, cages, cartons or crates, used to transport animals are to be well constructed, well ventilated, and designed in such a way to protect the health and ensure the safety of the animals.
 - b. These enclosures must be constructed or placed on the vehicles so that:
 - 1. Every animal in the vehicle has sufficient fresh air for normal breathing.
 - 2. The openings of these enclosures are easily accessible for emergency removals at all times.

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3. The animals are adequately protected from the elements, including heat and cold.
4. The animals are adequately protected from one another.
- c. Only animals of the same species shall be transported in the same enclosure. Puppies and kittens under six months of age shall not be transported in the same enclosure with adult animals, other than their mother.
- d. Each enclosure used to transport animals shall be large enough for each animal to stand erect, sit, turn about freely and lie down in a normal position.
- e. Animals shall not be placed in enclosures over other animals while being transported unless each enclosure is so constructed to prevent animal excreta from entering the other enclosures.
- f. All enclosures used to transport animals shall be disinfected after each use and as needed.

(4) *Care in transit.*

- a. The attendant or driver shall be responsible for inspecting the animals frequently enough to ensure the health and comfort of the animals and to determine if emergency care is needed and to obtain emergency care if needed.
- b. If any animal is in a vehicle for more than three hours, it shall be provided fresh, drinkable water, and food as appropriate.
- c. Each animal in transit shall have a tag affixed to its collar of a type approved by the U.S. Department of Agriculture.

(Ord. of 6-16-1987, § XX(A)(2), eff. 1-1-1988)

Sec. 4-99. - Records.

- (a) Every person who sells, gives, exchanges or otherwise delivers any animal to a collector must receive from the collector a written receipt, a copy of which is to be kept by the collector, signed by both the owner or keeper and the collector, stating the following:
 - (1) The number of animals received by the collector.
 - (2) The sex, breed and a general description of each animal received and the U.S. Department of Agriculture number assigned to each animal.

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- (3) The name, address and telephone number of the location to which the animal will be taken for the following five days.
- (4) The name, address and telephone number of the collector.
- (5) The name, address and telephone number of the person surrendering the animal.
- (b) A written report containing the information in subsection (a) of this section shall be delivered by the person collecting the animals to Animal Services within 24 hours of the surrender of the animal.
- (d) A record shall be kept of the disposition of every animal collected.
- (e) Every collector shall maintain a copy of all receipts and disposition records for one year.

(Ord. of 6-16-1987, § XX(A)(3), eff. 1-1-1988)

Sec. 4-100. - Quality assurance program.

A quality assurance program to ensure adherence to this division shall be carried out within the animal control division.

(Ord. of 6-16-1987, § XX(B), eff. 1-1-1988)

Sec. 4-101. - Application and enforcement of division.

The Animal Services Director shall be responsible for the full and proper application of this division. Questions concerning the applicability or interpretation of this division shall be the responsibility of the Animal Services Director.

(Ord. of 6-16-1987, § XX(C), eff. 1-1-1988)

Secs. 4-102—4-130. - Reserved.

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DIVISION 1. - DISPLAY OF WILD AND EXOTIC ANIMALS

Sec. 4-131. - Repealed

(Ord. of 8-14-2001(1), § 1, eff. 8-14-01)

Sec. 4-132. - Display of wild or exotic animals prohibited.

It shall be unlawful for any person to display or sponsor a display of wild or exotic animals on any public or private property within Orange County.

(Ord. of 8-14-2001(1), § 2, eff. 8-14-01)

Sec. 4-133. - Enforcement.

Any person displaying or sponsoring a display of a wild or exotic animal at the date that this Ordinance is adopted to prohibit such display shall comply with the Ordinance's prohibition on the display of wild or exotic animals within 30 days of the effective date of this Ordinance. No wild or exotic animals may be displayed that are not permitted by the United States Department of Agriculture nor shall any exotic or wild animal that has been designated a rabies vector species in North Carolina be displayed, except when approved by the Animal Services Director they may be displayed in a manner so as to not come into contact with the public.

(a) *Investigations.* The Orange County Animal Service Department shall investigate any complaints, reports or information that wild or exotic animals are being displayed or will be displayed in Orange County in violation of this Ordinance to determine whether or not a violation has occurred.

(1) If the Orange County Animal Services Department determines that wild or exotic animals are being displayed in Orange County in violation of this Chapter, the investigating officer(s) shall issue a written warning to the person displaying the wild or exotic animal(s). The written notice shall be delivered, via hand delivery to a responsible person or via posting at the site of the display.

(2) The person against whom the warning is issued shall desist all activities in violation of this Ordinance as of the business day the written notice is given.

(b) *Penalties.*

(1) Criminal Offenses - A violation of any provision of this Section constitutes a Class 3 Misdemeanor and shall be punishable as provided in North Carolina General Statutes § 14-4. Each day's continuing violation shall constitute a separate offense.

(2) Civil penalty - A person who violates any of the provisions of this Section shall be subject to a civil penalty of \$250 per animal for each day of the

Animal Control Ordinance

violation. No penalty shall be assessed until the person alleged to be in violation has been notified of the existence and nature of the violation by letter. Each day of a continuing violation shall constitute a separate violation. The Administrator shall make or cause to be made a written demand for payment to be served upon the person in violation, which shall set forth in detail a description of the violation for which the penalty has been imposed. If payment is not received or equitable settlement reached within 14 days after demand for payment is made, the matter may be referred to the County Attorney for institution of a civil action in the name of the County of Orange in the appropriate division of the general court of justice for recovery of the penalty.

(3) Injunctive Relief.

- a. Whenever the Orange County Animal Services Department or the North Carolina Wildlife Resources Commission has cause to believe that any person is violating or threatening to violate this Section, the agency shall report the violation or threatened violation to the Administrator. The Administrator may, either before or after the institution of any other action or proceeding authorized by this Section, institute a civil action in the name of the County of Orange for injunctive relief to restrain the violation of threatened violation.
- b. Upon determination by a court that an alleged violation is occurring or is threatened, it shall enter such orders or judgments as are necessary to abate the violation or to prevent the threatened violation. The institution of any action for injunctive relief under this section shall not relieve any civil or criminal penalty prescribed for violations of this Section.

(Ord. of 8-14-2001(1), § 3, eff. 8-14-01)

Sec. 4-134. - Severability.

If any provision of this Ordinance or the application thereof to any person or circumstance is declared to be invalid, such invalidity shall not affect other provisions or applications of the Ordinance which can be given effect without the invalid provision or application, and to this end the provisions of the Ordinance are declared to be severable.

(Ord. of 8-14-2001(1), § 3, eff. 8-14-01)

Secs. 4-135—4-180. - Reserved.

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DIVISION 2. - KEEPING OF WILD ANIMALS DANGEROUS TO PERSONS AND PROPERTY [4]

Sec. 4-181. - Definitions.

As used hereinafter, the following term shall mean:

Wild Animals Dangerous to Persons and Property, hereinafter referred to as "Wild and Dangerous Animals": The term applies to the following animals: all felines (other than the domestic house cat), nonhuman primates, bears, wolves, coyotes, reptiles (poisonous, crushing and giant), and any crossbreed of such animals which have similar characteristics of the animals specified herein. In order to properly administer the provisions of this Ordinance, the Board may add to or remove from the classification of wild animal any bird, mammal, reptile, aquatic and amphibious forms, or other members of the animal kingdom. Additions to or deletions from the animals regulated herein may be made only if the Board determines, after receiving evidence, that such animals because of habit, mode of life or natural instinct are either capable or incapable of being domesticated, requires the exercise of art, force or skill to keep them safely in subjection, and would or would not create a reasonable likelihood of hazard to the public.

(Ord. of 8-14-2001(2), § 1, eff. 8-14-01)

Sec. 4-182. - Keeping of wild and dangerous animals prohibited.

No person, firm or corporation shall keep, shelter, feed, harbor, or take care of any wild and dangerous animal within Orange County.

(Ord. of 8-14-2001(2), § 2, eff. 8-14-01)

Sec. 4-183. - Exemptions.

The provisions of this Ordinance shall not apply to the keeping of wild and dangerous animals as follows, provided, such keeping is in all respects in compliance with applicable federal and state rules and regulations:

- (a) Animals used for teaching and/or research purposes at The University of North Carolina at Chapel Hill.
- (b) Wildlife rehabilitators licensed by the state or the federal government to provide such services.

(Ord. of 8-14-2001(2), § 3, eff. 8-14-01)

Sec. 4-184. - Enforcement.

- (a) *Investigations.* The Orange County Animal Services Department or the North Carolina Wildlife Resources Commission shall investigate any complaints that a wild animal is possessed or harbored in Orange County in violation of this Ordinance to determine whether or not a violation has occurred.
- (b) *Penalties.*

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- (1) Criminal Offenses - A violation of any provision of this Section constitutes a misdemeanor and shall be punishable as provided in North Carolina General Statutes § 14-4. Each day's continuing violation shall constitute a separate offense.
- (2) Civil penalty - A person who violates any of the provisions of this Section shall be subject to a civil penalty of \$50.00 per animal. No penalty shall be assessed until the person alleged to be in violation has been notified of the existence and nature of the violation by letter. Each day of a continuing violation shall constitute a separate violation. The Administrator shall make or cause to be made a written demand for payment to be served upon the person in violation, which shall set forth in detail a description of the violation for which the penalty has been imposed. If payment is not received or equitable settlement reached within 14 days after demand for payment is made, the matter may be referred to the County Attorney for institution of a civil action in the name of the County of Orange in the appropriate division of the general court of justice for recovery of the penalty. Any sums recovered shall be used to carry out the purposes and requirements of this Ordinance.
- (3) Injunctive relief.
 - a. Whenever the Orange County Animal Services Department and the North Carolina Wildlife Resources Commission has cause to believe that any person is violating or threatening to violate this Section, the agency shall report the violation or threatened violation to the Administrator. The Administrator may, either before or after the institution of any other action or proceeding authorized by this Ordinance, institute a civil action in the name of the County of Orange for injunctive relief to restrain the violation or threatened violation.
 - b. Upon determination by a court that an alleged violation is occurring or is threatened, it shall enter such orders or judgments as are necessary to abate the violation or to prevent the threatened violation. The institution of any action for injunctive relief under this section shall not relieve any civil or criminal penalty prescribed for violations of this Section.

(Ord. of 8-14-2001(2), § 4, eff. 8-14-01)

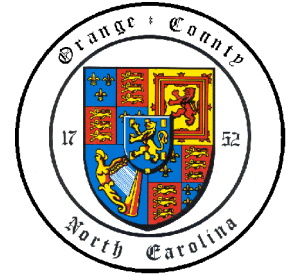
Sec. 4-185. - Severability.

If any provision of this Ordinance or the application thereof to any person or circumstance is declared to be invalid, such invalidity shall not affect other provisions or applications of the Ordinance which can be given effect without the invalid provision or application, and to this end the provisions of the Ordinance are declared to be severable.

(Ord. of 8-14-2001(2), § 5, eff. 8-14-01)

**Office of the County
Attorney**

**ORANGE COUNTY
P.O. BOX 8181
200 S. CAMERON STREET
HILLSBOROUGH, NC 27278**



MEMORANDUM

TO: Chief Walter Horton, Carrboro Police Chief

FROM: Annette M. Moore, Staff Attorney

RE: Unified Animal Control Ordinance

DATE: June 1, 2015

Attached please find the responses to the questions asked by the Carrboro Town Board.

1. Security Dog

Question: Alderman Haven O'Donnell asked about the term "security dog." County staff explained that the definition for the security dog was so broad that it captured any dog that barks when a person enters the property and the amended ordinance is now written to determine those types of situations on a case by case basis. The Town Attorney suggested additional review of the use of the term in the draft unified ordinance.

Answer: In the Unified Animal Control Ordinance "UAO" § 4-42(e)(5) exempt security dogs from the "vicious dog" section of the Ordinance while on the property of its owner or keeper; however, if it's off the property or its owner or keeper and it commits an offense it is subject to the Ordinance as if were not an security dog..

§ 4-42(e) Exceptions. The provisions of this Section do not apply to: (5) Security dogs are subject to all other provisions of this Ordinance while off the premises of their owner or keeper. (See Page 22)

A security dogs (§ 4-37) is defined as "[Any] dog used, kept or maintained on the premises of its owner or keeper for the purpose of protecting any person or property. Any such dog shall be further classified as a patrol dog or sentry dog." The term "watch dog" was removed from the definition of security dog because a dog on its owner's or keeper's property that approaches an intruder and barks or threatens to bite the intruder is neither vicious nor dangerous under the provisions of the Ordinance. The definition of "vicious," "dangerous" or "potentially dangerous" in the Ordinance and the North Carolina General Statutes does not provide for a designation of "vicious" or "dangerous" to a dog that was on its owner's

or keeper's property and barked or threatened to bite an intruder. The term "watch dog" didn't provide property owners any greater or fewer rights, require registration or training and caused undue confusion, therefore it was removed because it was superfluous. (See Page 10)

2. Appeals Process

Questions: Alderman Haven O'Donnell asked if there was room to allow the Carrboro Appeals Board to function in its current role. Ms. Moore stated that it is possible and that the draft can be amended to reflect the Board's comments.

Alderman Seils expressed concern with the change in the Carrboro Animal Control Board's role in the draft unified ordinance. Staff from Orange County stated that there would be a one Appeal Board for everything other than the livestock section that remains unique to Carrboro. All livestock appeals would be handled by Carrboro's Appeal Board. Alderman Seils suggested that the draft ordinance be amended to describe the changes to the County Appeals Board and to expand the membership to include majority members from each appeal jurisdiction. County staff stated that they would draft an amendment that addresses those concerns.

Answer: Section 4-54 of the Unified Animal Control Ordinance provides for an appeal to the UAO. The Carrboro Town Attorney drafted language revising § 4-54:

"Any appeal of this Chapter shall be filed within 5 days of the final decision made in the action. Appeals shall be heard by a three-member hearing panel. If the appealing party is not a resident of Carrboro, Chapel Hill or Hillsborough, the hearing panel shall consist of three members of the Orange County Animal Services Advisory Board. If the appealing party is a resident of Carrboro, Chapel Hill or Hillsborough, the hearing panel shall consist of two members of the Orange County Animal Services Advisory Board and one member of the Town, designated by such Town, in which the appealing party is a resident."

Chapel Hill and Hillsborough have approved the language currently in the UAO. I would recommend that if the Carrboro Board of Alderman would like the Carrboro Animal Control Advisory Board to continue in its present form, they could not adopt § 4-54 of the UAO and instead keep their appeals process. In § 4-54 I would the following language to that section "does not apply in Carrboro."

3. Amendments to the Unified Ordinance

Question: Alderman Chaney asked for clarification on how the unified ordinance gets amended by all jurisdictions.

Answer: Any amendments would first be discussed by staff within the respective jurisdictions and then brought before the governing bodies before going to the Board of County Commissioners. The Town Board would have the option of adopting the amendments, making modifications or not adopting them at all.

Please let me know if you have any additional questions.

**CHAPTER 10
ANIMAL CONTROL**

Article I - Definitions

~~Section 10-1 Definitions (Amend. 9/13/11)~~

Article II - Taxation and Tags

~~Section 10-2 Privilege Tax on Dogs and Cats~~

~~Section 10-3 Tax Administration~~

~~Section 10-4 Rabies and Identification Tags~~

(Repeal sections 10-4(a) and (b))

Article III - Livestock and Wild Animals

Section 10-5 Permits

Section 10-6 Applicability

Section 10-7 Revocation of Permit

Section 10-7.1 Feeding of Deer Prohibited (Created 11/01/11)

Article IV - Animal Control Program - Organization, Powers, Duties

Section 10-8 Animal Control Program

Section 10-9 Animal Control Officer(s)

Section 10-10 Interference with Administrator

Article V - Regulation and Control

~~Section 10-11 Confinement~~

~~Section 10-12 Animals Creating a Nuisance~~

~~Section 10-13 Dangerous Dogs~~

Section 10-14 Security Dogs

(See section 10-14(b) which includes notification Carrboro Police Department)

Section 10-15 Location and Maintenance of Animal Pens and Enclosures

~~Section 10-16 Stray Animals~~

Section 10-17 Dogs Prohibited Within Farmers Market

Section 10-17.1 Dog Owners Required to Remove Feces Deposited by Dogs

Section 10-17.2 Tethering of Dogs Generally Prohibited (Created 9/13/11)

Section VI - Rabies

~~Section 10-18 Administrator to Cooperate in Vaccination Programs~~

~~Section 10-19 Quarantine of Animals Suspected of Having Rabies~~

~~Section 10-20 Disposition of Rabid Animals~~

~~Section 10-21 Rabies Tag~~

Section VII - Impoundment, Release and Destruction

~~Section 10-22 Impoundment: Notice to Owner~~

~~Section 10-23 Release to Owner~~

~~Section 10-24 Adoption and Destruction~~

Section VIII - Care and Protection

~~Section 10-25 Cruelty to Animals (Amend. 09/13/11)~~

(Section 10-25(h) - Trapping was not included)

Section 10-26 Notice in Case of Injury

Article IX - Kennels and Pet Shops

Section 10-27 Applicability to Veterinarians

~~Section 10-28 Class I Kennels~~

~~Section 10-29 Class II Kennels~~

~~Section 10-30 Pet Shops~~

Article X - Animal Collection

~~Section 10-31 License and Permit Required~~

~~Section 10-32 Permit Procedure~~

~~Section 10-33 Minimum Information Required for Permit Application~~

~~Section 10-34 Minimum Requirements for Vehicles, Premises and Care in Transit~~

~~Section 10-35 Records~~

~~Section 10-36 Administration~~

Article XI - Enforcement, Appeals and Penalties

Section 10-37 Enforcement Administration

Section 10-38 Appeals

~~Section 10-39 Penalties and Remedies (Amend. 10/04/11)~~

Note: All sections that are in **bold** are not in the Unified Ordinance. The sections that have been struck through are in some form in the Unified Ordinance.

AN ORDINANCE AMENDING CHAPTER 10 OF THE CARRBORO TOWN CODE
(ANIMAL CONTROL)

THE BOARD OF ALDERMEN OF THE TOWN OF CARRBORO ORDAINS:

Section 1. Chapter 10 – Animal Control, of the Town of Carrboro Town Code is repealed with the exception of the following sections, which shall remain in full force and effect:

- a. Section 10-1(15) – definition of “livestock”;
- b. Section 10-1(21.1) – definition of “tether”;
- c. Section 10-2 – Privilege Tax on Dogs and Cats;
- d. Section 10-5(b) through (g) – Regulating the keeping of livestock within town limits;
- e. Section 10-7.1 – Feeding of Deer Prohibited;
- f. Section 10-17 – Dogs Prohibited Within Farmers Market;
- g. Section 10-17.1 – Dog Owners Required to Remove Feces Deposited by Dogs;
- h. Section 10-17.2 – Tethering of Dogs Generally Prohibited;
- i. Section 10-38 – Appeals (as amended by Section 2 of this ordinance, below).

Section 2. Subparagraph (a) of Town Code Section 10-38 Appeals is amended to read as follows:

- (a) The owner of any animal who (i) is required to remove his animal from the Town based upon a finding that the animal is or creates a public nuisance, or (ii) who has been assessed and has paid a civil penalty, or (iii) whose permit is denied or revoked pursuant to applicable regulations, or (iv) whose animal is declared to be “dangerous” or “vicious” pursuant to applicable regulations, may appeal to the Animal Control Board. An appeal shall be taken within ten (10) days after receiving written notice of the determination appealed from except that appeals from a determination that a dog is a vicious dog or dangerous dog shall be taken within three (3) days of notification. An appeal is taken by filing written notice of appeal with the administrator and stays all enforcement efforts of the administrator until the appeal is disposed of. An appeal from an order to pay civil penalties shall first be reviewed by the Chief of Police, or his/her designee, who shall have authority to affirm, revise or modify the order. If the owner is unsatisfied with the first civil penalty review, the owner may then appeal to the Animal Control Board of Appeals within ten (10) days of the Chief’s (or his/her designee’s) decision.

Section 3. All provisions of any town ordinance in conflict with this ordinance are repealed.

Section 4. This ordinance shall become effective upon the effective date of the revised Orange County Animal Control Ordinance now being considered by the Orange County, North Carolina Board of County Commissioners.

The foregoing ordinance, having been submitted to a vote, received the following vote and was duly adopted this ____ day of _____, 2015.

Ayes:

Noes:

Absent or Excused:

RESOLUTION AUTHORIZING ORANGE COUNTY ANIMAL CONTROL
ORDINANCE TO BE APPLICABLE WITHIN THE TOWN OF CARRBORO

Dated: November __, 2015

WHEREAS, the Town of Carrboro (the "Town") and Orange County (the "County") have heretofore each had separate animal control ordinances regulating the keeping and maintaining of domestic animals, pets, wild animals, and livestock; and

WHEREAS, the Town and the County consider it to be in their mutual best interests to work cooperatively with respect to the adoption and enforcement of ordinances regulating domestic animals, pets, wild animals and livestock;

WHEREAS, the Orange County Board of County Commissioners is now considering the adoption of a revised Animal Control Ordinance, to be found at Section 4-31 et seq of the Orange County Code of Ordinances;

WHEREAS, the Town has heretofore adopted and enforced regulations regarding keeping of domestic animals, pets, wild animals and livestock pursuant to Chapter 10 of the Town of Carrboro Code of Ordinances;

WHEREAS, pursuant to N.C. Gen. Stat. § 153A-122, the Town of Carrboro Board of Aldermen may by resolution permit the County's Animal Control Ordinance to be applicable within the city.

NOW, THEREFORE, the Town of Carrboro Board of Aldermen resolves as follows:

1. That upon the effective date of the revised Orange County Animal Control Ordinance, which is anticipated to be considered and adopted by the Board of County Commissioners on _____, 2015, the revised Orange County Animal Control Ordinance shall be applicable within the corporate limits of the Town of Carrboro to the extent that the County Ordinance is not inconsistent with Chapter 10 of the Town of Carrboro Code of Ordinances, as amended on November __, 2015.

2. This Resolution shall remain in full force and effect until the Town of Carrboro Board of Aldermen withdraws the permission granted herein, in accordance with N.C. Gen. Stat. § 153A-122.

This Resolution shall become effective upon the effective date of the revised Orange County Animal Control Ordinance.



Town of Carrboro

Town Hall
301 W. Main St.
Carrboro, NC 27510

Agenda Item Abstract

File Number: 15-0365

Agenda Date: 11/10/2015

File Type: Agendas

In Control: Board of Aldermen

Version: 1

TITLE:

North-South Corridor Study Presentation

PURPOSE: The purpose of this item is for the Board of Aldermen to receive a presentation from Chapel Hill Transit staff and consultants on the status of the North-South Corridor Study on Bus Rapid Transit in Chapel Hill.

DEPARTMENT: Planning

CONTACT INFORMATION: Bergen Watterson, Transportation Planner - 919-918-7329,
bwatterson@townofcarrboro.org

INFORMATION: Chapel Hill Transit has been working on a feasibility study for Bus Rapid Transit along 15-501 and Martin Luther King Jr. Blvd. corridor (N-S Corridor) since January of 2014. Town staff and representatives from the Board of Aldermen have been involved in the project through Chapel Hill Transit Partners, technical committee and policy committee meetings.

Chapel Hill Transit staff and consultants will provide a presentation on the status of the North-South Corridor Study and preliminary recommendations that include six alternatives. All six alternatives assume Bus Rapid Transit (BRT). The goal is to receive feedback from the Board of Aldermen on these alternatives.

The same six alternatives were presented to the Chapel Hill Transit Partners on October 27th and the Chapel Hill Town Council on November 9th. This information will also be provided to UNC and shared with the public at open houses in early December.

Using the combined feedback from various stakeholders, the project team will develop the final Locally Preferred Alternative (LPA) recommendation. The committees will review the recommendation and forward it to the Chapel Hill Transit Partners for consideration. Assuming the project timeline does not change, the Partners will review and recommend the final LPA to the Town Council at the January meeting.

It is important to note that this study is the first step in the federal process. It is a feasibility study to determine if the project is viable for further examination. Future phases (beyond the current study) would include detailed engineering, traffic and environmental work.

Agenda Date: 11/10/2015

File Type:Agendas

In Control: Board of Aldermen

Version: 1

FISCAL & STAFF IMPACT: Receiving the report and providing feedback have no fiscal impact, and require minor staff time. Depending on the nature of the final LPA and federal approval of the project, non-federal funds will be necessary to support project implementation, but the amount and the source of these funds are unknown at this point.

RECOMMENDATION: Staff recommends that the Board receive the presentation and provide feedback on the six alternatives.



TOWN OF CHAPEL HILL NORTH CAROLINA

MEMORANDUM

Meeting Date: 11/09/2015
AGENDA #[##]

TO: Roger L. Stancil, Town Manager

FROM: Brian Litchfield, Transit Director;
Mila Vega, Transit Service Planner

SUBJECT: North-South Corridor Study Update

Recommended Council Action

- That the Council receive an update on the status of the North –South Corridor Study and provide feedback on the proposed alternatives.

Context with Key Issues

The North-South Corridor Study (NSCS) represents a significant step towards achieving the goals established by the Chapel Hill 2020 Comprehensive Plan which calls for improved transit service within the corridor. The study, which began in January 2014, is the first step in the federal process that helps determine the viability of potential transit investment within this study corridor. Following a multi-phased alternative development and evaluation process, supported by public engagement initiatives, a total of six (6) Bus Rapid Transit (BRT) alternatives have been developed for further review within the corridor. All alternatives include variations of three (3) different runningway options: Mixed Traffic with Transit Signal Priority (TSP), Dedicated Lanes – construct (add a bus lane to the existing roadway) and Dedicated Lanes – convert (convert an existing travel lane into a bus-only lane).

• Background

The North-South Corridor Study (NSCS) is a project that is being led by Chapel Hill Transit (CHT) in coordination with the Chapel Hill Transit Public Transit Committee, which includes the Town of Chapel Hill, the Town of Carrboro and the University of North Carolina - Chapel Hill. The project, which is being funded through a combination of federal and local funds, will identify and evaluate a series of transit investment alternatives for implementation within the study corridor, which runs along the Martin Luther King, Jr. Boulevard (Historic Airport Road/NC Hwy 86), South Columbia Street (including the portion of Pittsboro Street along the one-way pairing in this corridor through UNC campus), and US 15-501 South. This corridor, which is approximately 7.3 miles long, has its northern terminus at Eubanks Road and Martin Luther King, Jr. Boulevard and its southern terminus at US 15-501 near the Southern Village mixed-use development (Attachment 1: Corridor Map).

The study was initiated in January 2014; a detailed schedule is presented in Attachment 2: Schedule.

This study represents a significant step towards achieving the goals established by the Chapel Hill 2020 initiative. The study expands on previous planning work to identify a locally-preferred

transit investment alternative that facilitates safe, efficient and expanded levels of mobility within the increasingly busy study corridor, and to improve connectivity between the corridor and the Research Triangle region. Additional reasons for this study include improving connections with other local and regional transit routes (including the planned Durham-Orange Light Rail line), supporting future development within the corridor, increasing transit mode share and ridership to the UNC campus/hospital, and improving multimodal connectivity options between the new Carolina North campus on the northern end of the study corridor, Southern Village at the southern end of the corridor, and the rest of the study corridor.

Following a multi-phase, iterative alternative development and evaluation process that is supported by extensive public engagement activities, the Chapel Hill Transit Public Transit Committee will recommend the Locally Preferred Alternative (LPA) to the Chapel Hill Town Council for adoption. The LPA will be the transit investment alternative that best meets the purpose and need for the project and is competitive for funding through the Federal Transit Administration's New/Small Starts capital funding program. The Town Council will submit the LPA, if adopted, to the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) for integration into its 2040 Metropolitan Transportation Plan.

- **Study Committees:**

The study is guided by the input from the Policy Committee and the Technical Committee.

The Policy Committee is responsible for the overall direction of the study. The committee meets at major milestones during the study to facilitate the analysis, community input and project deliverables. The committee members provide policy guidance throughout the study process.

The Policy Committee members are:

- Aaron Nelson - Chapel Hill-Carrboro Chamber of Commerce
- Bobby Funk - Chapel Hill Downtown Partnership
- Anna Wu - UNC Facilities
- Than Austin - UNC Transportation and Parking
- Damon Seils - Town of Carrboro Alderman
- Roger Stancil - Town of Chapel Hill Town Manager
- Ed Harrison - Town of Chapel Hill Council Member, CHT Public Transit Committee Member

- Debbie Collins/Chuck Edwards - North Carolina DOT
- Karen McCall - UNC Hospitals
- Mark Ahrendsen/Felix Nwoko – Durham-Chapel Hill-Carrboro MPO
- David Andrews - Town of Carrboro Town Manager
- Jim Ward - Town of Chapel Hill Council Member, CHT Public Transit Committee Member
- Michael Parker – Planning Commission Member
- Josh Kastrinsky - Transportation and Connectivity Advisory Board Member

The Technical Committee is responsible for advising on technical issues during the study. The committee is a cross-section of transportation, planning and development professionals from the

public and private sectors, community and business leaders. The committee meets monthly during the development of the study.

The Technical Committee members are:

- Brian Litchfield/Mila Vega - Chapel Hill Transit
- David Bonk/ Kumar Neppalli - Town of Chapel Hill
- Christina Moon/Bergen Watterson- Town of Carrboro
- Than Austin/Kurt Stolka - UNC Transportation and Parking
- Jeff Watson - UNC Hospital
- Chuck Edwards - North Carolina DOT
- Patrick McDonough/Geoff Green - GoTriangle
- Craig Benedict - Orange County
- Seth Lajeunesse - Carrboro Transportation Board

- **Public Involvement:**

Two rounds of public meetings have been held to introduce the study and collect public feedback. Round 1 was held in March 2014 and Round 2 in October 2014. More than 125 participants attended the meetings. Forty (40) Bus Rapid Transit (BRT) budget exercises collected (the respondents were clearly more in favor of investments in runningway design and ITS/Technology); 45 comment cards collected.

There was a common theme in the comments related to the runningways options (mixed traffic, dedicated side lanes and dedicated center lanes). Seventy percent (70%) of the respondents like BRT in Dedicated Side Lane; 63% of respondents like BRT in Dedicated Center Lane; 57% of respondents did not like BRT in mixed traffic. Bicycle and pedestrian accommodations also stood out as elements important to the community.

Round 3 – currently planned for December 2015. The public will be able to weigh in on the proposed alignment and runningway configurations.

- **Status and Work Completed:**

Purpose and Need Statement: One of the first documents developed was the Purpose and Need Statement. The purpose of the North-South Corridor Study is to identify and implement the transit investment strategy that will accommodate anticipated growth in travel demand within the corridor, support mobility options that match emerging demographic trends and preferences within the corridor, leverage the existing transportation infrastructure to improve connectivity within the corridor, and encourage sustainable development patterns that reduce reliance on single-occupant vehicles.

Project needs are summarized below:

- Project Need #1: Chapel Hill Transit ridership has increased by more than 20 percent between 2005 and 2012, and buses often operate at capacity during weekday peak hours on multiple routes. Existing demand is straining capacity, which is reducing operational efficiency and

resulting in schedule slippage and bus stacking. Investment in transit system capacity will ensure that existing rider demand is accommodated and future rider demand is supported.

- **Project Need #2:** Chapel Hill is comparatively young, but its fastest-growing demographic is over age 65. In 2010, the median age of Chapel Hill residents was 25.6; the median age of US residents was 37.2. From 1970 to 2012, the over-65 age group increased the most relative to all other age groups (from 4.5 percent to 9.4 percent). Academic research and industry experience has found that both of these demographic groups are increasingly choosing transit for either lifestyle/environmental/economic reasons (Millennials) or mobility reasons (senior citizens).
- **Project Need #3:** Major development opportunities at the northern and southern ends of the corridor will fundamentally reshape mobility patterns and needs within the corridor. The adopted 2020 Chapel Hill Comprehensive Plan designates several development focus areas along the corridor. The Town has approved several new developments within the corridor, including Carolina North, and is reviewing several others for approval. This level of development will expand the number of key activity generators within the study corridor and result in increased travel demand as more people seek to access them.
- **Project Need #4:** Multi-modal transportation investments are necessary to accommodate anticipated increases in travel demand resulting from planned development within the corridor. Recent technical analyses completed as part of the Carolina North development have forecast that – in the absence of mitigation measures - corridor roadways will reach unacceptable levels of congestion by 2030. The scale of roadway expansion required to mitigate this congestion is unlikely to be financially feasible, environmentally sensitive, or aligned with Chapel Hill’s vision for growth.
- **Project Need #5:** Chapel Hill – and the surrounding region – has demonstrated a commitment to sustainable growth strategies in their adopted plans and policies. Chapel Hill’s 2020 Comprehensive Plan calls for a transportation system that accommodates transportation needs and demands while mitigating congestion, promoting air quality, supporting affordable housing goals, sustainability and energy conservation. Transit service also plays a critical role in increasing access to services. High-capacity transit system investment that leverages existing transportation facilities while reducing reliance on single-occupant vehicles will be necessary to achieve these goals.

Tier 1 and Tier 2 Analysis - The Tier 1 Analysis was the first step of the North-South Corridor Study’s three-step alternative development and evaluation process. This two-part analysis applied a series of qualitative evaluation criteria against the modes and alignments under consideration to assess how well each meets the project Purpose and Need and to gauge overall implementation viability. Each mode and alternative was ranked as “pass” or “not pass” for each evaluation criterion, and then given an overall assessment of “pass” or “defer.” Those modes and alignments given an overall assessment of “pass” became the subjects to detailed definition and evaluation in future project phases. Those given an overall assessment of “defer” were set aside from the North-South Corridor Study for possible consideration in future projects.

The alternatives being carried forward into Tier 2 Analysis are No Build, BRT Low, and BRT High operating along MLK Jr., Boulevard/Columbia Street/US 15-501 from the Eubanks Road Park and Ride Lot or a future Park and Ride site northeast of I-40 through downtown Chapel Hill to Southern Village at Dogwood Acres Drive. No Build alternative is the existing CHT system as it operates today with minor changes in service to reflect changes proposed in the Orange County Bus and Rail Investment Plan. BRT Low and BRT High represent various levels of BRT investments that range from improvements such as Transit Signal Priority (TSP), enhanced stations, dedicated lanes, etc.

Figure 1: Tier 1 Results - Modes

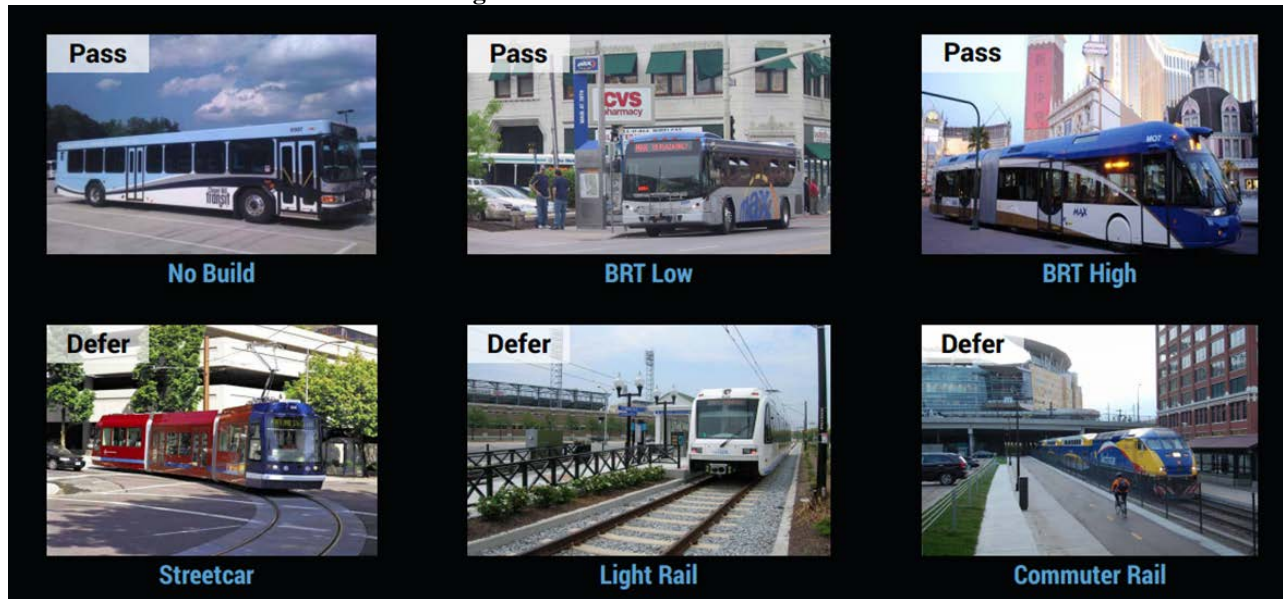
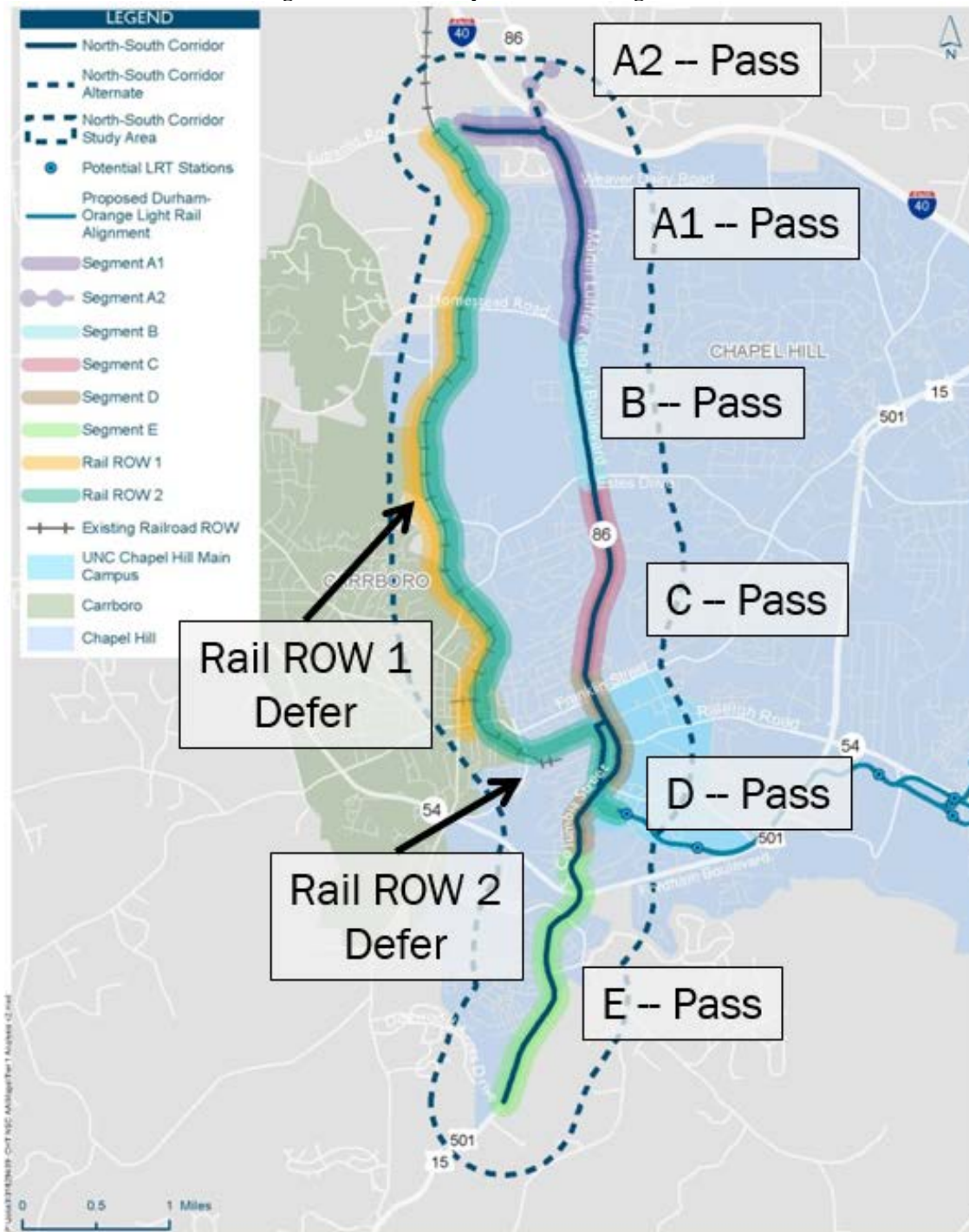
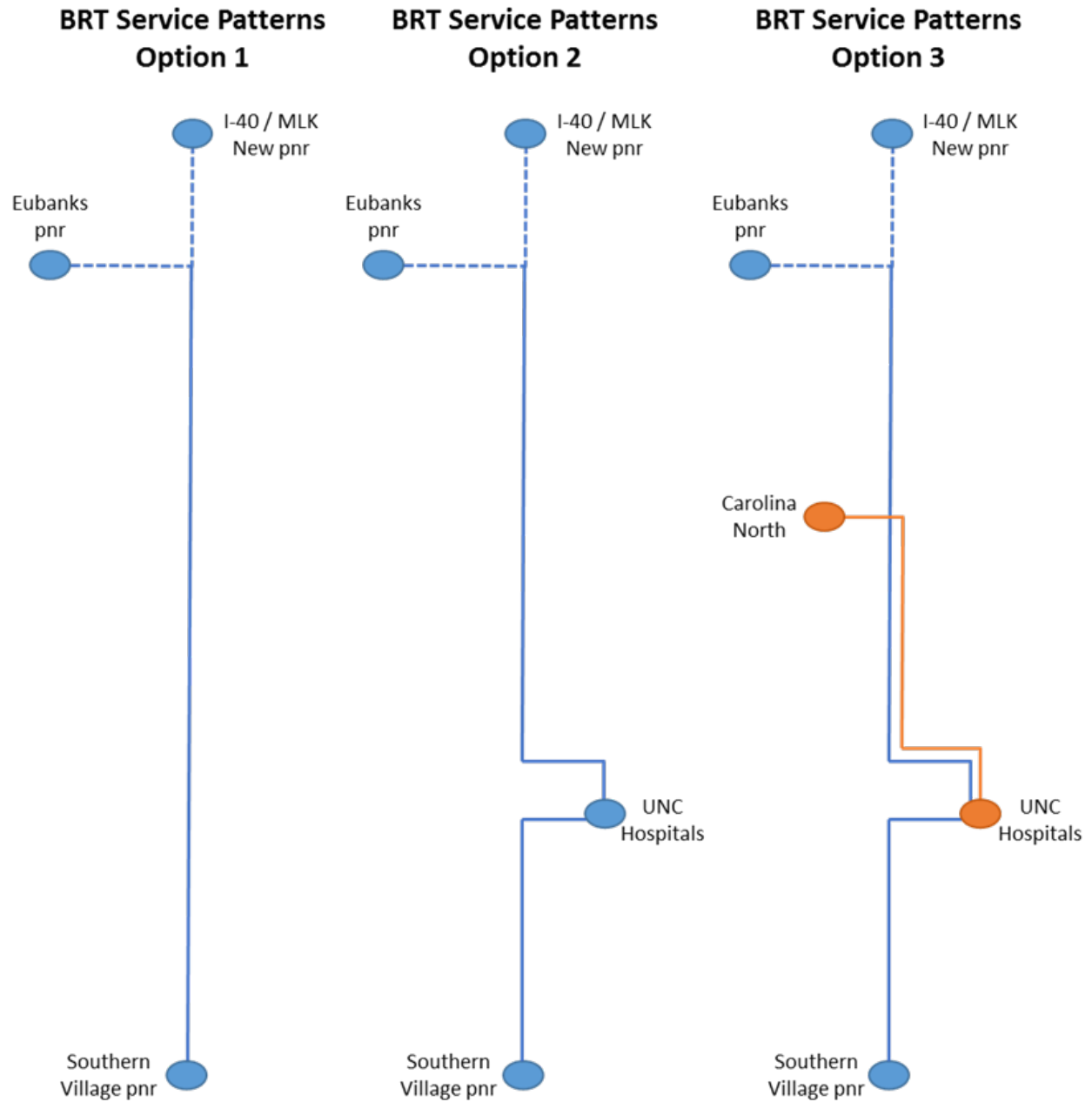


Figure 2: Tier 1 Analysis Results - Alignments



Detailed Definition of Alternatives – The following elements were included in the detailed definition of alternatives: service plan, stop spacing, stop facilities, transit vehicles, technology and customer information, identity and branding and maintenance facility. The main differentiator between the alternatives is runningways options: mixed traffic, dedicated center lane or dedicated side lane.

There are 3 different Bus Rapid Transit (BRT) alternative alignments being carried forward:



Explanation of Recommendation

The following six (6) Bus Rapid Transit (BRT) alternatives are included in the preliminary recommendations developed by the consultant team and the study committees (Attachment 3: North-South Corridor Study Proposed Alternatives).

1. Alternative 1 would operate in mixed traffic between the Eubanks Road Park and Ride lot and the Southern Village Park and Ride lot, with routing into the UNC Hospital campus. The BRT would operate in mixed traffic with transit signal priority along the length of the corridor except between Estes and Manning Drives, where the BRT would operate in dedicated transit lanes. The dedicated lanes would be converted from general traffic use to exclusive transit use.
2. Alternative 2 would operate in mixed traffic with transit signal priority between the Eubanks Road Park and Ride lot and Estes Drive, then would operate in exclusive dedicated transit lanes (converted from general traffic) between Estes and Manning Drive. South of Manning, the BRT would operate in mixed traffic with transit signal priority between Manning Drive and Purefoy Road, at which point the BRT would operate in dedicated transit lanes (newly constructed, which would require the addition of lanes) to the Southern Village Park and Ride lot.
3. Alternative 3 would operate in dedicated transit lanes along the length of the corridor from the Eubanks Road Park and Ride lot to the Southern Village Park and Ride. The dedicated transit lanes would be converted from general traffic lanes between Estes Drive and Purefoy Road; the dedicated lanes would be constructed (requiring the addition of lanes) on the northern end of the corridor (between Eubanks Road and Estes Drive) and the southern end of the corridor (between Manning Drive and Southern Village).
4. Alternative 4 would operate in mixed traffic with transit signal priority between the Eubanks Road Park and Ride lot and Estes Drive, then would operate in exclusive dedicated transit lanes (converted from general traffic) between Estes and Manning Drive. South of Manning, the service would route through the UNC Hospitals campus using mixed traffic with transit signal priority operations through Purefoy Road. South of Purefoy, the BRT would operate in dedicated transit lanes (newly constructed, which would require the addition of lanes) to the Southern Village Park and Ride lot.
5. Alternative 5 would operate in a dedicated lane along the entire corridor between Eubanks Park and Ride lot and the Southern Village Park and Ride lot. The dedicated transit lanes would be converted from general traffic lanes between Estes Drive and Manning Drive; dedicated lanes would be constructed (requiring the addition of lanes) on the northern end of the corridor (between Eubanks Road and Estes Drive) and the southern end of the corridor (between Purefoy Road and Southern Village).
6. Alternative 6 would operate in a dedicated lane along the majority of the corridor between Eubanks Park and Ride lot and the Southern Village Park and Ride lot, with routing into the UNC Hospitals campus. The dedicated transit lanes would be converted from general traffic lanes between Estes Drive and Manning Drive; the BRT would operate in mixed traffic with transit signal priority through the UNC Hospital campus between Manning Drive and Purefoy Road. Dedicated lanes would be constructed (requiring the addition of lanes) on the northern end of the corridor (between Eubanks

Road and Estes Drive) and the southern end of the corridor (between Purefoy Road and Southern Village).

The detailed evaluation results and six (6) alternatives will be presented to the public at a series of open houses in early December 2015. Following the incorporation of the feedback from these open houses, the Policy and Technical Committees will recommend a preferred alternative(s) to the Chapel Hill Transit Public Transit Committee, who will then review and recommend the alternative(s) to the Chapel Hill Town Council for consideration and potential adoption as the Locally Preferred Alternative(s) in early 2016.

Fiscal Note

- Fiscal impact is under development.

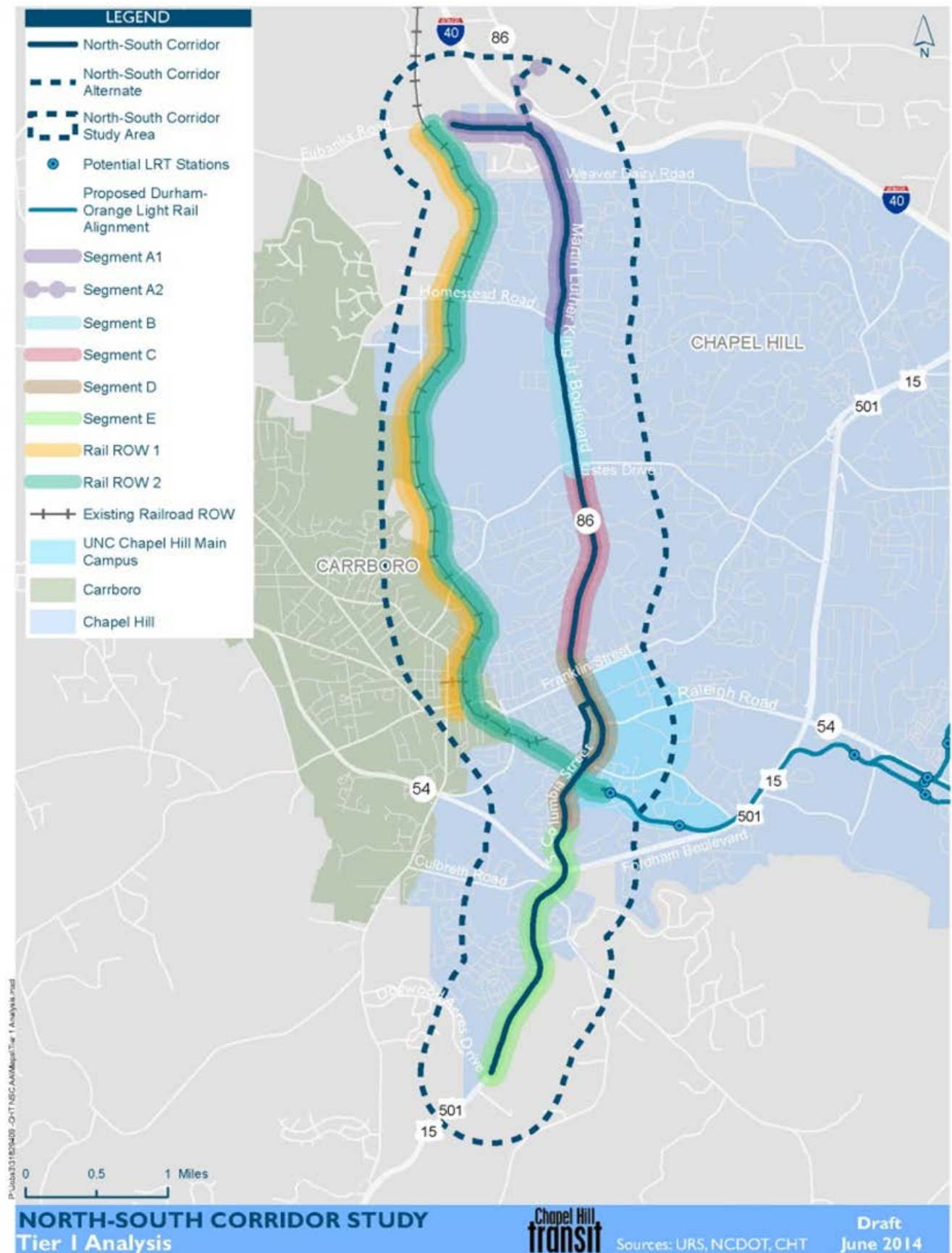
Council Goal:

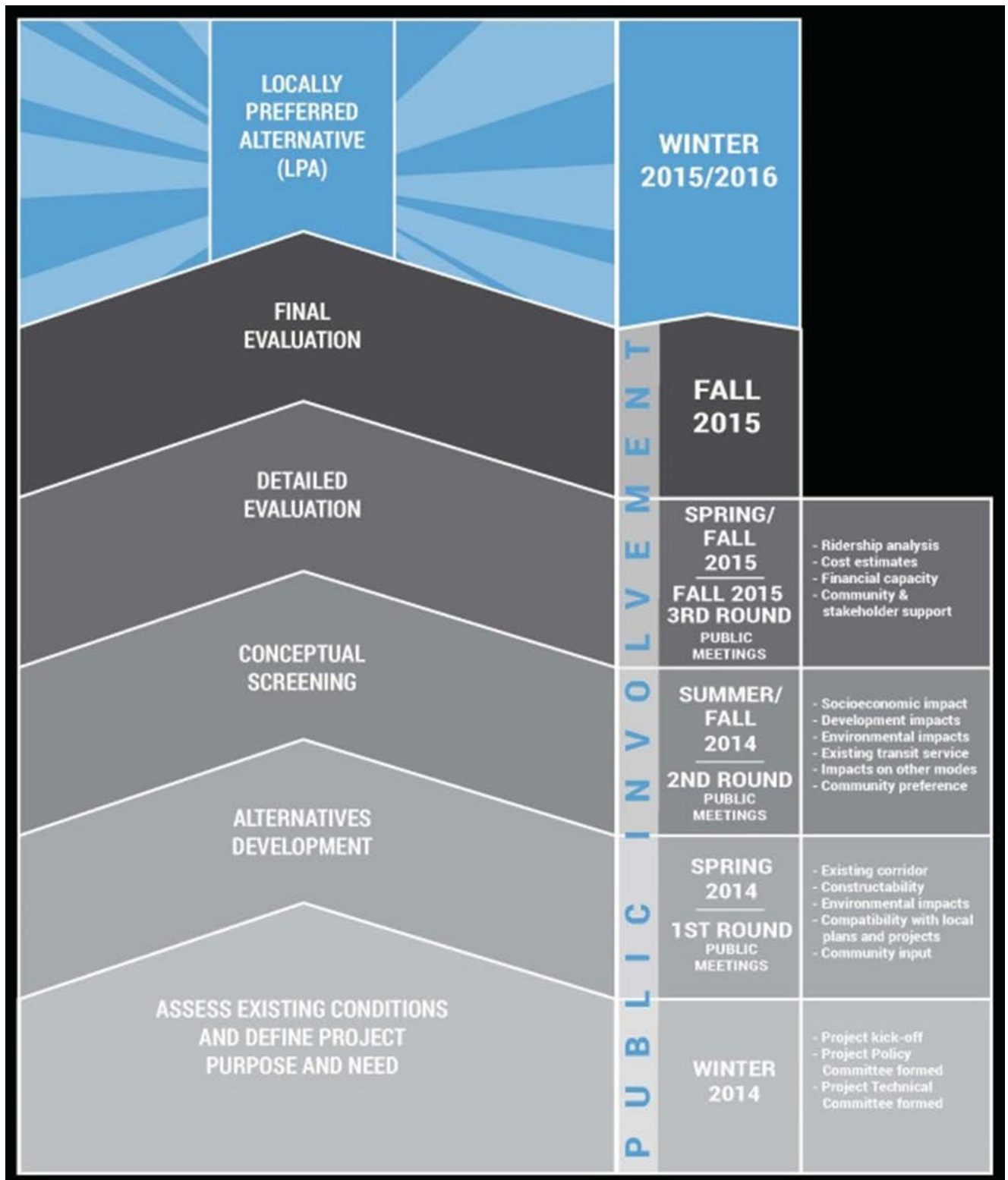
- Facilitate Getting Around
- Support Community Prosperity and Engagement

Attachments

- Attachment 1: Corridor Map
- Attachment 2: Schedule
- Attachment 3: North-South Corridor Study Proposed Alternatives

Attachment B: Corridor Map







North-South Corridor Study Proposed Alternatives | Draft October 2015





Town of Carrboro

Town Hall
301 W. Main St.
Carrboro, NC 27510

Agenda Item Abstract

File Number: 15-0359

Agenda Date: 11/10/2015

File Type: Agendas

In Control: Board of Aldermen

Version: 1

TITLE:

Energy and Climate Action Task Force Community Climate Action Plan

PURPOSE: The purpose of this item is for the Energy and Climate Action Task Force to provide an update on the draft Community Climate Action Plan

DEPARTMENT: Planning

CONTACT INFORMATION: Randy Dodd, 919 918-7326

INFORMATION: At the May 27, 2014 meeting, the Board of Aldermen created a temporary Energy and Climate Action Task Force charged with supporting the Town with community planning for climate mitigation/protection and resiliency. The Task Force was asked to prepare a report to submit to the Board of Aldermen that provided recommendations for new actions to reduce nonrenewable energy use and greenhouse gas emissions from residential and commercial buildings and transportation, promote renewable energy, and better manage vegetation, soil, and impervious surfaces to capture carbon, reduce energy use in buildings, mitigate the heat island effect, and reduce stormwater runoff.

Using information from the advisory board 2014 fall forum series reports as a starting point, the Task Force has deliberated in 2014 and 2015, presented a draft Community Climate Action Plan to the Board of Aldermen on June 23rd and to Advisory Boards on September 3rd, and has subsequently updated the draft plan and considered the feedback from the Board of Aldermen and Advisory Boards. The Task Force would like to update the Board on its deliberations, and is seeking a final Board review of the draft plan. This Community Climate Action Plan forwards the Town's participation in the Cities for Climate Protection campaign. It is designed as a companion document to the Energy and Climate Protection Plan adopted in May of 2014, which focuses on Town operations. In tandem, the plans are major steps toward reducing greenhouse gas emissions, protecting the environment, and engaging the broader community.

A public hearing date of April 26, 2016 has been identified to allow time to share the plan with the public. Public outreach will begin with a drop in session tentatively scheduled for January 14, 2016

FISCAL & STAFF IMPACT: There is no fiscal or staff impact associated with accepting the Task Force's report and draft plan. If the Board chooses to set a public hearing as a step in formally adopting the plan, the Town will incur the typical costs associated with holding a public hearing.

Agenda Date: 11/10/2015

File Type:Agendas

In Control: Board of Aldermen

Version: 1

RECOMMENDATION: It is recommended that the Board 1) receive the Task Force presentation and draft Community Climate Action Plan; and 2) adopt the draft resolution directing staff to set a public hearing April 26, 2016.

**A RESOLUTION ACCEPTING THE
ENERGY AND CLIMATE ACTION TASK FORCE RECOMMENDATIONS**

WHEREAS, the Town has signed on to the Mayors Climate Protection Agreement and adopted a Climate Protection Resolution in 2009;

WHEREAS, the Town participated in the Orange County Greenhouse Gas Inventory, Capstone Teams updated the community inventory in 2011 and 2015, and municipal operations inventories have been completed annually since 2012, and

WHEREAS, the Town completed its first Energy and Climate Protection Plan in 2014 focusing on municipal operations, and

WHEREAS, a temporary Energy and Climate Action Task Force was formed in 2014 to present community climate action recommendations;

WHEREAS, the Task Force has presented a draft Community Climate Action Plan;

NOW THEREFORE BE IT RESOLVED by the Carrboro Board of Aldermen that the Aldermen accept the Task Force presentation and draft Community Climate Action Plan.

Furthermore, the Board:

- 1) sets a Public Hearing for April 26, 2016 to receive additional public input on the draft plan.
- 2) _____
- 3) _____
- 4) _____

MEMORANDUM

To: Board of Aldermen
David Andrews, Town Manager

Through: Randy Dodd, Environmental Planner
Christina Moon, Planning Administrator
Patricia McGuire, Planning Director

From: Energy and Climate Task Force

Date: Wednesday, November 4th, 2015

Subject: Community Climate Action Plan: Response to Review Comments

Background and Summary

This memo is a companion to the Community Climate Action Plan. The intent of the memo is to summarize the Task Force response to review comments provided.

Information

The Energy and Climate Task Force has been meeting since the fall of 2014 to draft a Community Climate Action Plan. The draft plan is being developed as a step in supporting the community in reducing greenhouse gas emissions, becoming more energy efficient, generating more renewable energy, and nurturing a social and ecological environment that is more resilient, livable, and attuned with the epochal change currently occurring. The plan we have drafted recommends a goal of a 50% reduction in per capita greenhouse emissions by 2025, and includes over 25 specific recommendations relating to community integration, buildings, transportation, renewable energy, and ecosystem protection and restoration.

On June 23rd, 2015, the Board of Aldermen provided feedback to a draft of a Community Climate Action Plan. In September/October, the Task Force presented the draft plan at the Advisory Board Joint Review. (Formal/final comments from advisory boards are provided in a separate document). The Task Force has updated the plan in consideration of the review. Our attempt to encapsulate and capture specific review comments offered by the Board of Aldermen and Advisory Boards (through November 4) is provided below, along with the Task Force responses, with attribution to the person or Advisory Board providing the initial feedback.

Community Integration: Capacity, Partnering, Community Organizing

- a) Hire Sustainability Coordinator (several BoA members; PB) *Task Force is behind this 100% and recommends that the Town hire a Sustainability Coordinator in the coming fiscal year (please see reworked Community Integration, Recommendation #5).*
- b) Pursue partnering approach with Chapel Hill to create joint stormwater utility (EAB, PB). The county is in a position to take leadership with composting (PB). *The Task Force concurs that partnering in principal for both stormwater and composting is worth pursuing, and also recommends that the Town be prepared to move forward if obstacles to partnering emerge.*
- c) Incorporate interns in climate action implementation, especially in FY 15/16; look into green conservation corps, grants (Bethany); *Task Force in general supports and defers to Town for best way to pursue.*
- d) Use Solarize as community organizing model to expand capacity (Michelle); Look at Solarize for apartment complex, church, park, parking lots (Lydia). *The three things that have made Solarize a successful community program are lowering installation costs, reducing consumer complexity, and*

motivating change. These elements have been captured in the Community Integration Recommendations.

- e) Provide additional detail on outreach approach in community integration recommendations and specifically to HOAs/neighborhoods (Randee, Sammy). *The Task Force has developed a new introduction for Community Integration Recommendation: Create Grass Roots Partnerships to Engage Community. The specific approach will depend on the community program and the Task Force recommends that these details be developed during the implementation phase.*
- f) Consider more detail on identifying partners and highlighting joint programs (Damon); support coordination with other partners (Michelle) *The Task Force strongly agrees that developing partnerships is critical to the success of this Climate Action Plan and where we were able, they have been listed in the report. The specific approach will depend on the community program and the Task Force recommends that these details be developed during the implementation phase.*
- g) See if some neighborhoods are interested in “opting out” of streetlights (Lydia, Sammy). *Task Force in general supports and defers to Town for best way to pursue.*
- h) Work with restaurants for a “Meatless Monday” initiative (Lydia) *Task Force supports this. Meatless Monday Community programs added to Implementation Opportunities under Community Integration, Recommendation #1.*
- i) Coordinate with schools/school groups (Michelle/Sammy) *Task Force supports this and has listed Chapel Hill Carrboro City Schools, PTAs, and School Student Groups as partners under multiple recommendations. When a Sustainability Coordinator is hired, we recommend that s/he meet with the CHCCS District Sustainability Coordinator to discuss ways to partner and coordinate efforts.*

2) Community Integration: Affordability/Social Justice/Economic Issues

- a) Highlight/find intersection between environmental and social justice approaches (Damon). *Task Force recommends that the focus of this nexus be in the relationship between pursuing affordable housing and energy efficiency and clean energy. A Community Integration Recommendation has been added titled “Integrate Climate Action and Social/Equity Initiatives.”*
- b) Have Task Force meet with Affordable Housing Task Force; look at Affordable Housing document as model; use portion of AH Trust Fund to support? (Michelle). *Task Force member(s) intend to attend AH Task Force meeting on November 19.*
- c) Review OWASA report/engage with OWASA to address affordability and find transferability in their strategies (Bethany). *Task Force in general supports this and defers to Town for best way to pursue, while recognizing the significant difference between OWASA as a locally based water and sewer provider and the electric and natural gas utility providers serving Carrboro. This may significantly affect the transferability of the strategies.*
- d) Identify means for addressing economic issues for middle class (Jacquie). *The Community Integration Recommendations are designed to make it easier and more affordable for all citizens to save money while switching to clean energy.*
- e) Support for QECB recommendation (PB). *The Community Integration Recommendation #5 encourages Carrboro to pursue QECB authority to secure low cost financing to facilitate community energy efficiency and renewable energy projects.*

3) Buildings

- a) Highlight building certification recommendation (Michelle). *Task Force appreciates the identification of this priority and defers to Town and implementation of recommendations for best way to pursue.*
- b) Would a downtown geothermal district require State authority? (Sammy) *Task Force defers to Town to explore this question, and also recommends that the Town contact a qualified professional with expertise in geothermal/geotechnical studies for advice on feasibility of geothermal in downtown area based on soils, geologic, and development features.*
- a) Use thermal imaging to look at energy leaks (Sammy) *This suggestion has been incorporated into Building Recommendation #2: Require Energy Audit / Performance Rating.*
- c) Pursuing energy performance beyond minimum for new buildings not recommended as point of emphasis (PB). *The Task Force recognizes that going beyond current building code requirements brings in added complexity and challenges. To address the recommended climate action goal, we believe that both regulatory and non-regulatory options for new construction should be considered.*

4) Transportation: Promotion

- a) Plan more bike to work days (Michelle); designate every Friday bike/walk day (Lydia). *Task Force in general supports and defers to Town/TAB for best way to pursue. The plan suggests considering weekly bike to work days under Transportation Recommendation #5.*
- b) Coordinate with TTA and local businesses to promote vanpooling (Michelle); Parking lot id'd for regional transit (Lydia). *Task Force in general supports and defers to Town/TAB for best way to pursue.*
- c) Further promote bike/car/ride sharing (Bethany). *Task Force in general supports and defers to Town/TAB for best way to pursue.*

5) Transportation: Other

- a) Support transit and idling recommendations (PB); More leading by example (including idle reduction) from Town fleet (TAB member). *Task Force in general supports and defers to Town/TAB for best way to pursue.*
- b) Determine if Town has authority for reducing vehicle idling (Randee) *Task Force defers to Town*
- c) Professional facilitation for Bolin Creek Greenway (TAB members); Remove Bolin Creek Greenway from plan (TAB member). *Revised language under Transportation Recommendation #2 to make it clear that the goal is to approve a route for a North South greenway connector. The recommendation is to research alternatives if it has not already been done and then bring in a facilitator to guide the decision process.*
- d) Pilot/initiate Green Streets Program (TAB member). *Task Force in general supports and defers to Town for best way to pursue.*
- e) Multimodal focus in future developments (TAB member). *Task Force in general supports and defers to Town/TAB phase for best way to pursue.*

6) Ecosystem Protection/Restoration

- a) Support the creation of stormwater utility or joining Chapel Hill's utility (Randee; PB; EAB; TAB member). *Task Force considers this to be a high priority topic and asks the Town to look into this as a next step. Hold a "lunch and learn" on stormwater utility for Board/staff/Task Force (Bethany). An FAQ on stormwater utilities has been developed to provide more in-depth information on the subject.*

- b) Recommend ordinance review/amendments (e.g., tighten up invasive plant requirements) (Damon). *Task Force understands that reviewing invasive plant requirements is in the current work plan for staff, with a request to set a public hearing planned in the near future.*
- c) Prioritize the deer herd management recommendation (EAB) *Task Force considers this to be a high priority topic and asks the Town to look into this.*
- d) Promote natural/wild yards (TAB member) *The Task Forces supports this. Backyard Wildlife Habitat Certification Programs added to Implementation Opportunities under Community Integration, Recommendation #1.*

7) Other Comments

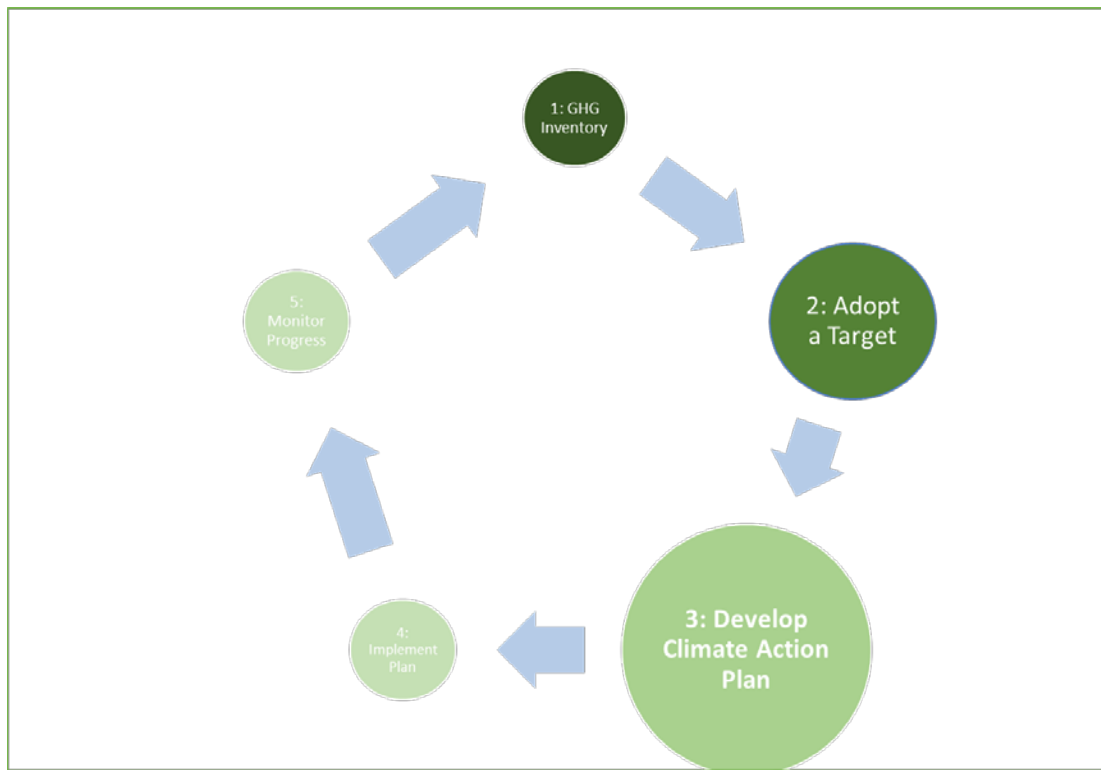
- a) Recruit/fill in Task Force vacancies, especially with members who can address social/economic topics. *The Task Force recommends that the current Task Force “sunset” and the Board create a new, standing Task Force with the charge to implement the recommendations provided herein, and with a membership composition that is responsive to this concern.*
- b) How will progress towards goals and recommendations be measured/evaluated? (PB) *The Task Force recommends that progress towards goals be measured and evaluated through future greenhouse gas inventories and other metrics developed as part of plan implementation.*
- c) Create more accessible public version of plan (PB) *The Task Force concurs with this recommendation, and also recommends that it include a web component and be developed as part of plan implementation.*
- d) Can the cost of implementation be estimated? (PB) *It is beyond the scope of the Task Force’s work to pursue a fiscal/economic analysis, and given the scope, inherently a very complex undertaking. Having said that, we do assert that energy efficiency and renewable energy improvements are investments that provide economic benefits over time. Philosophically, the Task Force recommends a holistic approach that includes upfront costs, benefits over time, and the environmental and public health costs of not taking action. When analyzed in this way, Climate Action Plans for other municipalities have been shown to have substantial economic benefits for the Town’s financial position and the economic viability of the community.*
- e) Include an introductory section for each (not just some) of the recommendations (PB). *The Task Force has pursued this recommendation in the final draft of the plan.*

Recommendation

It is recommended that the Town: adopt the draft Climate Action Plan; pursue the implementation recommendations offered in the plan; and consider the above supplemental comments to the plan.

Community Climate Action Plan

**Reducing Greenhouse Gas Emissions, Saving Energy,
Generating Renewable Energy, and Enhancing Ecosystems**



**Town of Carrboro, North Carolina
November 4, 2015**

**Prepared by the Carrboro Energy and Climate Protection Task Force
Carolyn Buckner, Jeff Herrick, Kathy Kaufman, Jeanette O'Connor, Rob Pinder**

With support from

**Board of Aldermen Liaisons Randee Haven O'Donnell and Sammy Slade
and Town Staff Randy Dodd**

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The Carrboro Board of Aldermen for adopting a proactive climate protection resolution, and feedback on a draft of this plan.

Those who have worked to develop and support previous greenhouse house gas inventories for Carrboro and Orange County.

The many people and organizations in the community involved in climate action work.

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Executive Summary

In 2009, the Carrboro Board of Aldermen passed a resolution committing the Town to take steps to reduce emissions of greenhouse gases that are causing global climate change. In doing so, and through work leading up to the resolution with other Orange County governments, the Town joined a group of more than 1000 cities, towns and metropolises around the world who are taking part in the Cities for Climate Protection Campaign. The campaign follows a 'Five Milestone' process that includes a greenhouse gas (GHG) emissions inventory, establishment of an emissions reduction target, development and implementation of an action plan to reduce emissions, and monitoring of emissions reductions measures.

This document expands on previous efforts, with an emphasis on completion of the second milestone – further articulation of a reduction target, and the third milestone – the drafting of a Local Climate Action Plan. In 2014, Carrboro developed a plan focusing on the Town's municipal operations. This plan is a companion and follow up to that effort with an emphasis on measures that the broader community is asked to take in order to achieve GHG reduction targets. The recommendations offered are intended to reduce greenhouse gas emissions, while raising the community's awareness of and involvement in solutions to global climate change and a post-carbon energy future, adaptation to changes and enhancement of ecosystem resilience.

A significant recommendation of this report is for the Town and community to adopt a goal of a 50% reduction in greenhouse gas emissions by 2025, as supported by a broad community campaign. Several dozen additional recommendations are provided around the themes of community integration, energy efficiency of buildings, transportation, renewable energy, and ecosystem protection and restoration. Measures outlined in the Plan to reduce greenhouse gas emissions not only contribute to overall climate change mitigation, but can also provide the community with many local benefits such as financial savings through energy efficiency, the creation of new jobs, improved air quality and public health, and a healthier forest and streams.

Whether or not the broad campaign advocated for in this plan takes off or flounders will depend on many factors. The Task Force believes the following "next steps" are crucial to building momentum: 1) a new version of this Task Force needs to be created and made permanent; 2) the Town needs to devote more resources towards implementing the plan, starting with creating a Sustainability Coordinator position; 3) the first assignment for the coordinator should be to turn the recommendations in this plan into an outreach and engagement program; 4) new partnerships and initiatives need to be pursued and championed by community members; and 5) last not but not least, individuals, businesses, and in effect the entire community need to take the recommendations in this report to heart.

Introduction

“Recognizing that all human economic activity is a subset of nature’s economy and must not degrade its vitality is the starting point for systemic transformation of the energy system.”¹

There is widespread scientific agreement that the increasing quantity of greenhouse gases (GHGs) in the atmosphere is causing temperatures to rise and increasing the frequency and severity of extreme weather events, and that human activities are the primary cause.² The accumulation of greenhouse gases is a major threat to the climate stability of the earth. Arguably, no other issue threatens our planet with such dramatic, far-reaching impacts, and no other issue is so clearly a worldwide problem. The world’s leading scientists predict that, in the absence of radical societal change, global average temperature will rise from 2.7 to 11 degrees F. within our children’s lifetimes. Already, effects of climate change are being seen, from melting of the Arctic permafrost, to the disappearance of glaciers worldwide, to rising sea levels around islands and other low-lying areas, and the acidification of oceans. Erratic weather and extreme events such as droughts, floods, heat waves, avalanches and hurricanes are becoming more common.

The primary cause of global climate change is the burning of fossil fuels such as petroleum, coal, and natural gas. These activities release gases such as carbon dioxide and methane that accumulate in the atmosphere and trap the sun’s heat, thereby warming the earth – the so-called “greenhouse effect”. The greenhouse effect is essential for life on earth, but rapidly increasing levels of greenhouse gases during the past 200 years are now destabilizing the climate. Average global temperature have already risen an unprecedented 1-2 degrees F during this period, and the impacts of emissions that have already occurred will take decades to cycle through ecosystems. Carbon dioxide concentrations in the atmosphere have reached their highest level in 160,000 years, and are rising at a rate 500 times higher than ever before in history.

In Carrboro, the effects of climate change over the next century are likely to be significant. They may include the migration of hardwood forests northward to cooler areas. We will have to cope with hotter summers and more frequent floods, droughts, and intense storms, with more money diverted to repair damage from these events. Our natural resources could experience a broad range of negative trends and losses, and ecological diversity will likely decline. All of the careful planning, stewardship of beautiful natural places, promotion of biodiversity, and other crucial work at the local level will be rendered meaningless if we cannot stave off the worst consequences of climate change. As members of the world community, we will have to deal with challenges involving food security, human health, and scarce resources. Humanity is beginning to respond to the unprecedented transition from the industrial era to

¹ [The Energy Reader: Overdevelopment and the Delusion of Endless Growth](#), Tom Butler, Daniel Lerch, and George Wuerthner, eds. (Healdsburg, CA: Watershed Media, 2012)

² <http://www.townofcarrboro.org/DocumentCenter/Home/View/1213>

the era that is to follow. Local governments and communities can address the challenge and opportunity of the transition and specifically reducing greenhouse gases in a number of creative ways.

The 2014 Orange County State of the Environment³ report provides a similar message:

“A report focused on Orange County alone also risks underemphasizing global climate change, the most pressing environmental threat we face. Our use of fossil fuels here, whenever we start a car engine or run our air conditioners, adds to the accumulation of carbon in the atmosphere that is rapidly destabilizing our climate. In 2012, leading climate activist and writer Bill McKibben summarized how close we are to reaching the limits of our carbon budget: *Scientists estimate that humans can pour roughly 565 more gigatons of carbon dioxide into the atmosphere by midcentury and still have some reasonable hope of staying below two degrees [Celsius] increase in global temperature. (“Reasonable,” in this case, means four chances in five, or somewhat worse odds than playing Russian roulette with a six-shooter)....Reaching or surpassing that two degree rise in average global temperatures risks catastrophic consequences for our ability to grow food, maintain access to drinking water, and generally perpetuate human civilization as we now know it.*”

Beyond Doom and Gloom

*What we’re for is leaving behind the current energy economy, which is wasteful, polluting, and centralized; assumes perpetual growth; and is anchored by nonrenewable fuels. We envision a bold leap toward a future energy economy that fosters beauty and health; that is resilient because it emphasizes renewable, community-scale energy generation; that supports durable economies, not growth; and that is informed by nature’s wisdom.*⁴

The previous section presents a stark, sobering, and ominous picture and one that we all need to acknowledge and recognize. However, only laying out the danger associated with climate change neglects humanity’s capacity, ingenuity, and adaptability. It also can be counterproductive by effectively triggering a “fight and flight” response, or being received as a judgment for denial and lack of action. The reality of climate change also presents tremendous opportunity for transition to living in a more satisfying, resilient, and connected community that is less reliant on fossil fuels.⁵ In addition, some measures are often necessary and/or more effective at the municipal/community level than at other levels. This plan is intended to inspire this community and others to accelerate and ramp up efforts, and begin to make significant reductions in the level of climate-changing gases now being produced.

³ http://www.orangecountync.gov/document_center/DEAPR/2014_SOE_complete_report.pdf

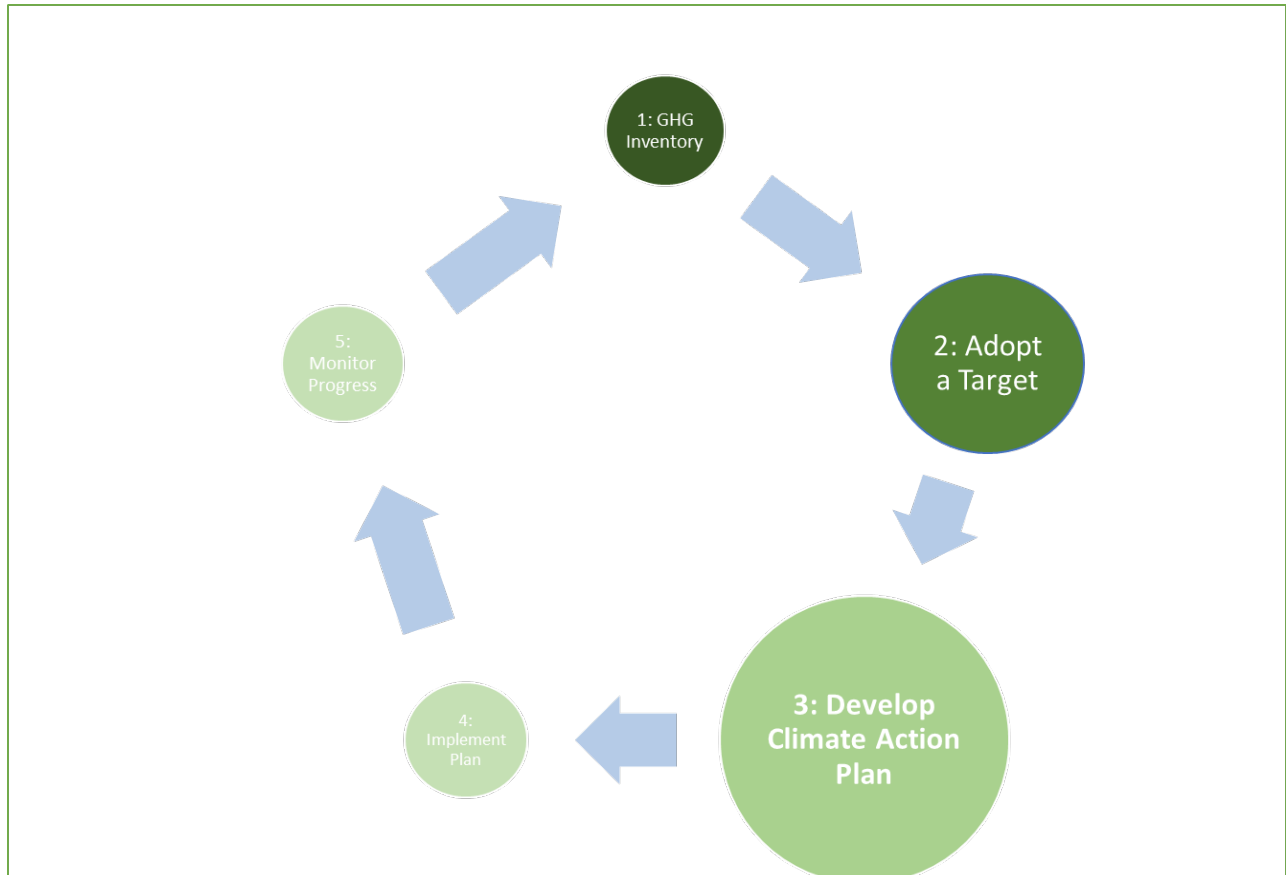
⁴ [The Energy Reader: Overdevelopment and the Delusion of Endless Growth](#), Tom Butler, Daniel Lerch, and George Wuerthner, eds. (Healdsburg, CA: Watershed Media, 2012)

⁵ <http://www.wri.org/news/2014/10/release-new-analysis-highlights-opportunities-economic-gains-climate-action-united>

The Cities for Climate Protection Campaign and the Five Milestone Process

The Cities for Climate Protection (CCP) campaign is a global project led by the International Council for Local Environmental Initiatives (ICLEI), a membership association of local governments dedicated to addressing global environmental problems through local action. The CCP was established by ICLEI in 1993 at an international summit of municipal leaders. The CCP has engaged many municipal governments in North Carolina, the U.S and abroad in a worldwide effort to slow the earth's warming. The CCP campaign follows a 'Five Milestone' process (Figure 1).

Figure 1:
Cities for Climate Protection Five Milestone Climate Action Planning Process.



The size of each circle indicates the relative emphasis in this plan. The darkness indicates the amount of attention already given to each milestone based on work in Carrboro over the past decade, as discussed in the text.

The Greenhouse Gas Emissions Inventory⁶

Carrboro collaborated with other jurisdictions in Orange County and ICLEI to complete the first countywide Greenhouse Gas Emissions Inventory for the baseline year of 2005. In 2011, a UNC Capstone Team completed a community scale inventory specifically for Carrboro based on data for 2009. Every year beginning in 2012, the Town has updated the municipal operations inventory, and in 2015, a second UNC Capstone Team updated the community inventory based on data for 2012 and assisted the Town in entering the inventory data into the ClearPath software which will help the Town with future climate action planning steps. These inventories help establish a baseline and guide the community to develop and implement strategies to mitigate emissions by understanding the sources and quantity of emissions. They also provide a means to monitor changes over time.

Establishing Emissions Reductions Goals

The countywide inventory included an initial attempt to identify potential goals in terms of “tiers” of “least aggressive” to “most aggressive” climate action strategies. In 2009, the Board of Aldermen passed a resolution resolving that the Town “will seek, and will facilitate the community at large, to cut CO₂ emissions by its proportion of the amount which is required to stabilize the climate back to <350 ppm of CO₂ ..., and asks staff to evaluate how to achieve this target for municipal operations and the community”.⁷ As part of municipal inventories, annual reduction goals of 2-7% have been discussed and the 2014 plan set a goal of a reduction in emissions from municipal operations on the order of 5-10% within a 2 year time frame. Other notable climate goals are listed in the table below.⁸ In its Clean Power Plan to reduce carbon dioxide emissions in the power sector, EPA has set a unique target emissions rate for each state to achieve by 2030. 8 states are asked to reduce emissions by 41%-50%, 24 states are asked to reduce emissions by 31%-40%, and the remainder of the states are asked to reduce emissions by 30% or less. 8 large US cities have signed on to the Carbon Neutrality Alliance.

⁶ More information on previous inventories is available on the Town’s website:

<http://www.townofcarrboro.org/271/Greenhouse-Gas-Inventories>

⁷ 1990 is when global CO₂ concentrations first surpassed 350 ppm. To date, Carrboro emissions have not been estimated for 1990. Town staff have asked those providing support with completing emissions inventories to attempt to estimate emissions for 1990. The uncertainties due to the lack of data and difficulty deriving credible assumptions have proven too great to complete this task. It is certainly hypothetically possible to “backcast” emissions. For example, some factors could lead to lower per capita emissions such as industry/technology standards (e.g. more efficient vehicles, buildings, and appliances), more availability of transit and bicycle and pedestrian infrastructure, economic factors leading to changing behavior (e.g., fuel costs), and growing awareness and concern. Other factors could lead to higher per capita emissions, such as suburbanization, less affordable housing locally, and social/cultural norms and consumer choices with higher footprints (e.g., larger vehicles and homes and less active lifestyles and more emphasis on comfort and convenience) leading to more single occupancy vehicle trips, vehicle miles traveled (this has been documented) and use of fossil fuels. Assumptions could also be derived from national/international reports, however the bias that could be introduced is uncertain.

⁸ Appendix 2 outlines a hypothetical example of a “typical” American household becoming carbon neutral in 10 years.

Table 1: Examples of Climate Action Goals

| Scale | Entity | Reduction Goal | Date |
|--------------------|---------------------------|--|------|
| National/Countries | United States | 26 - 28% of 2005 | 2025 |
| | Department of Defense | 30% reduction in energy use; 20% of energy from renewable sources | 2020 |
| | China | 20% of energy from non-fossil sources | 2030 |
| States | California | 40% | 2030 |
| Cities | Seattle | Net zero/climate neutral (community) | 2050 |
| | Asheville | 80% from 2011 (4%/year; municipal) | 2030 |
| | Chapel Hill | 60% of 2006 ⁹ | 2050 |
| | Durham | 30% (community) 50% (municipal) of 2005 | 2030 |
| | Boulder, CO ¹⁰ | 80% (community) | 2050 |
| Businesses | Weaver Street Market | Net zero via efficiency, rooftop solar, purchased green power | 2020 |
| Utilities | OWASA (2015 draft) | 35%/5% reduction in purchased electricity/natural gas (2020 vs. 2010) Pursue biogas to energy and renewable energy projects | 2020 |
| Universities | UNC | Net zero/climate neutral | 2050 |
| | Warren Wilson College | 80% of 2007/8 | 2020 |

One purpose of this Plan is to provide a new recommendation on a community scale emissions reduction goal. Climate action goals can be framed in a variety of ways to best meet a particular entity's needs and values. The Task Force recommends that Carrboro's Climate Action Goal: meaningfully reduce greenhouse gas emissions at a time scale that is urgent; encourage growth and shared prosperity; and be able to be measured and certified. With these criteria in mind, the Task Force recommends this Carrboro Climate Action Goal:

It is recommended that Carrboro adopt the goal of a 50% reduction in per capita greenhouse gas emissions by 2025. We recommend a goal to cut the carbon footprint in half over the next 10 years for the entire community, Town operations, the buildings and transportation "sectors", and ultimately each resident and business.

⁹ Reduction is on a per capita basis. Interim goals are 5 percent by 2010, 10 percent by 2015, 20 percent by 2030, 30 percent by 2040; 45 percent by 2045, and 60 percent by 2050.

¹⁰ Appendix 1 provides more information on the leadership Boulder is providing with local climate action.

This goal is a meaningful reduction in carbon/greenhouse gas pollution that is consistent with the scientific recommendations calling for the large emission reductions needed to reduce the risk of dangerous climate change. It is both ambitious and achievable with the support of the Town and community. It is framed in per-capita terms to recognize that Carrboro continues to attract new residents and businesses and to make it easy for any individual, business, or organization to measure and demonstrate their progress toward the goal. Investments in energy efficiency and renewable energy offer very favorable returns and substantial reductions in energy costs. This can power a virtuous cycle, where more energy costs are reduced and more income is available for local consumers and businesses. There are also external factors that will help the community make progress. The electric utilities in North Carolina are required to generate more electricity from renewable sources by 2021. National fuel economy standards will likely continue to reduce gasoline use. The proliferation of more energy efficient lighting, appliances and heating/cooling equipment is already reducing household energy use, and transportation options with smaller footprints are expanding.¹¹

The Local Climate Action Plan

The U.S. Department of Energy has developed a “Guide to Community Strategic Energy Planning” that identifies two types of planning efforts: one focusing on the government operations and one focusing on the community at large. The former: includes a focus on government buildings, facilities, infrastructure, and transportation; concentrates on activities for which the government has direct influence – e.g., personnel, planning, and budgeting – which means tighter control over implementation. The latter (community-wide plan) is a broader plan to address activities that: expands the focus to include energy saving activities across the jurisdiction (residential, commercial, industrial, transportation, and other sectors) of the broader community; recognizes that, while local government actions can greatly influence, energize, and leverage effective activities in the broader community, the government has less direct control over these activities in comparison to a government-only plan. This plan focuses on the community wide plan.



¹¹ Appendix 2 provides a hypothetical example of how a household can become carbon neutral in 10 years. Appendix 3 presents a discussion of how to approach this goal from a social and psychological perspective.

The measures recommended below provide the basis for the first comprehensive community scale climate action plan specifically for Carrboro. They are a companion to measures presented in the 2014 plan that focused on municipal operations. Other local governments and agencies and UNC continue to be engaged in similar locally relevant efforts^{12,13,14}. To emphasize, the Task Force recommends that the Town pursue a two-part climate action strategy. Strategy 1 is to provide leadership by following through with the recommendations outlined in the 2014 report. The Town of Carrboro efforts to reduce emissions sets an example for residents, businesses, and institutions. Strategy 2 is to further develop a community based initiative as detailed in this document and guided by the recommended Carrboro Climate Action Goal in tandem with a goal to protect and restore local ecosystems. Details for how to pursue these broader goals is provided in the following sections, starting with the critical element of the mobilization of the Carrboro community in support of the goals of this plan.

Community Integration

“Local” climate action planning has important but limited influence within a personal to global continuum (Table 1). The collective choices, behaviors, norms, requirements, and plans and agreements at lesser and greater social scales than that of a town of 20k people arguably have greater influence on GHG than the municipal/community scale. A very large share of the GHG footprint in the community occurs because of the collective impact of private decisions made by residents and businesses for which the Town has very limited involvement and oversight, and also within a global social context and the constraints of state, federal, and international laws, regulations, agreements and corporate (large scale) decisions. In terms of other levels of organization and governance and how they interact with community scale climate action planning, the following are important (and in some cases unique) points in Carrboro and indicate the Town’s interdependence with many other entities in pursuing climate action planning:

- 1) The Chapel Hill-Carrboro City School system and OWASA both have separate policy, fiscal, and administrative processes from the Town, and therefore, different boards and staff. They also have larger emissions, facilities and operating budgets than Carrboro has, and therefore, an ability to have a greater influence on emissions reductions;
- 2) Transit is a public service that has the ability to significantly mitigate emissions. Chapel Hill Transit is a cooperative effort between Carrboro, Chapel Hill and UNC; GoTriangle is a multi-county/regional transit authority serving over a million people;
- 3) Currently, Carrboro on its own has very limited influence on larger electricity and natural gas utilities. Duke Energy provides electrical service to over 90% of Carrboro. Carrboro is also served by Piedmont Electric Membership Cooperative, which buys its electricity from Duke for resale. PSNC is the local natural gas provider. This is in contrast to local governments operating municipal utilities.

¹² <http://www.townofchapelhill.org/town-hall/departments-services/planning-and-sustainability/sustainability>

¹³ <http://www.owasa.org/energy-management>

¹⁴ <https://climate.unc.edu/GreenhouseGasInventory>

- 4) Carrboro's largest emissions sector is buildings, with most building emissions being residential, and most of the residential building sector being non-owner occupied. Oversight by the North Carolina Utilities Commission, management by the above utilities, and regulation by building codes (which are established at state/federal levels) are strong non-market/public sector drivers that influence emissions from buildings. Landowner and landlord management and decisions are strong private sector drivers. Social/cultural norms influence both public and private sectors.
- 5) The Town has very limited oversight of Homeowners Associations (HOAs) (less in fact than the state of North Carolina). Carrboro did recently update regulations to limit new HOAs ability to constrain an individual homeowner's desire to pursue sustainability measures.

Table 1: Local Climate Action Planning is One Layer in a Continuum ¹⁵

| Organizational Examples | Scale | General Scale (population) | Climate Action "Primary Domain" Examples |
|--|--------------|-----------------------------------|---|
| Personal | | 1 person | Personal choices (e.g., dietary, housing, transportation, vocation, financial, consumer) |
| Household/family | | ~2-10 people | "Home economics" (e.g., housing, transportation, landscaping/gardening, financial, consumer) |
| Neighborhoods, small businesses, clubs, nonprofits, congregations | | ~10-100 people | Small organization organizing, management, fossil fuel divestment |
| Schools, co-ops, larger clubs, businesses, congregations, corporations | | ~100-1000 people | Business/organization planning and management; fossil fuel divestment |
| Small towns, colleges, co-ops | | ~1k-10k people | Sustainability plans; land use and transportation; fossil fuel divestment |
| Towns, small utilities, universities | | ~10k-100k people | Local climate action/sustainability plans; land use and transportation; local living economy; fossil fuel divestment |
| Cities, medium utilities, counties | | ~100k-1M people | Local climate action/sustainability plans; land use, transit/transportation; fossil fuel divestment |
| Regions, states, large utilities/utility commissions | | ~1M-10M people | Transit/transportation; utility regulation; State law; Building Code; fossil fuel divestment |
| Nations, international | | ~>10M people | Climate summits/agreements; carbon pricing; IPCC; building code; federal laws; trade agreements; multinational corporate policy; fossil fuel divestment |

¹⁵ This table does not fully address continuums of access to capital and decision making authority, nor to sociological and cultural dimensions, all of which add complexity. The point of this table is to illustrate that climate action transcends all scales, and to help define the "space" in which community scale climate action planning occurs.

6) At a municipal scale, Carrboro’s “primary domain” or area of most effective focus for local climate action planning could be in partnership with organizations and entities operating at a similar scale. Similarly, for work in the community, it is important to establish initiatives and measures that work at the appropriate scale, and to bridge gaps across the different scales.

7) The community sector accounts for 93% of greenhouse gas emissions within Carrboro; the remaining 7% comes from local government operations. Significant community buy-in in every aspect of this plan is essential for emissions reduction and climate change mitigation.

The Task Force offers recommendations in this section that focus on grassroots/neighborhood scale efforts and enhancing the Town and community capacity for supporting climate action. The recommendations are integrative in that they apply to all of the other recommendations provided, and are focused on community enhancement and participation.

Community Integration Recommendation #1: Create Grass Roots Partnerships to Engage Community

Create new Grass Roots Partnerships and Engage Community to be a Part of the Solution

Widespread community participation is needed to meet the emissions reduction and climate change mitigation goals of this plan. Carrboro is fortunate to have many local groups already involved in environmental outreach and climate action. In addition, many successful models for community engagement in climate action can be adapted and used here. While these are mostly grassroots efforts, a leader such as a sustainability coordinator is needed to coordinate, adapt, promote, and sustain efforts over the long term.

| | |
|------------------------------|---|
| Implementation Opportunities | Many local and other groups are involved in environmental outreach and/or climate action. These include but are not limited to Transition Streets, Pete Streets, NW Earth Institute community action courses, the Solarize Carrboro model, Awakening the Dreamer Symposiums and Game Changer Intensive, K-12 Sustainability Curriculums (Chapel Hill-Carrboro City Schools is currently developing a local version), Grey to Green Initiatives, <u>HEAT</u> (Heat Energy Assessment Technologies), Meatless Monday Communities, Backyard Wildlife Habitat Certification Programs, and Incentive Programs. Carrboro can adapt and use programs with proven track records for community engagement. |
| Implementation Challenges | <ul style="list-style-type: none"> • Who will bring partners together? • Who will recruit and train community facilitators? • How to ensure that a diverse group is reached? • Who will modify programs if needed? • How will engagement/momentum be sustained over time especially in consideration of a relatively transient population? (59% of residential |

| | |
|---------------------------------------|---|
| | properties in Carrboro are rental properties) |
| Resources Needed (human and material) | <ul style="list-style-type: none"> • Money for education and promotion materials. • Leadership ideally from a nonprofit, along with new Town staff. • Support such as technical assistance and loans or grants for low-income households, stakeholder incentives, etc. |
| Leadership | Grassroots but will need a leader or nonprofit organization to adapt, promote, and sustain efforts. A town sustainability coordinator would be ideal. |
| Partners | Pickards Mountain Eco-Institute, Chapel Hill-Carrboro City Schools (including District Sustainability Group and Student Environmental Groups), UNC Sustainability Program, Orange County Solid Waste Program, NC Cooperative Extension Service, Chapel Hill Sustainability Officer and Committee, Transition Carrboro- Chapel Hill, NC Botanical Gardens, Carrboro Greenspace, Carrboro Bike Coalition, Solarize Carrboro, Carrboro Farmers Market, Irvin Learning Farm and Nature Center, NC Sierra Club, Friends of Bolin Creek, Morgan Valley Alliance, Home Builders Association of Durham, Orange, and Chatham, Neighborhood Homeowners Associations, Faith Based Environmental Groups, Carrboro Farmers Market, Carrboro Business Alliance, businesses, utility providers, Homeowner associations, former Pete Street participants and more |
| Fit with Items | Every section of this Action Plan |
| Time Frame | This can move forward as soon as leadership is identified. The time frame for a Sustainability Coordinator and permanent Task Force on board is a key factor. |
| Next Step(s) | <ul style="list-style-type: none"> • Identify partners; • Bring partners together and choose programs; • Modify programs for Carrboro if needed; • Work with partners to recruit and train diverse group of facilitators. • Pilot program in facilitator's neighborhoods • Debrief with pilot neighborhoods and modify programs as needed. • Install neighborhood and/or town wide dashboard to show progress, and build a climate change action oriented community. |
| Evaluation Criteria | People reached. Energy saved. Forest and soil protected or gained. |

Community Integration Recommendation #2: Expand Public Partnerships to More Explicitly Consider Climate Action

Pursuing Carrboro's Climate Action Goals Will Require Expansion of Current Partnerships and Creation of New Partnerships.

As a small town with limited capacity and jurisdiction and many existing partnerships, it makes sense for Carrboro to work cooperatively with a variety of partners to pursue Carrboro's Climate Action goals. In some cases, it may be possible to emphasize these goals through existing partnerships, and in other cases, it could make sense to create a new partnership. As a small local government, collaborating with other local public sector partners has particular appeal. Examples of opportunities through both existing and new partnerships are discussed below and elsewhere in this report and summarized in the table.

Developing a partnership for improved energy efficiency of buildings is a special challenge. Carrboro and Chapel Hill, with support from federal stimulus funding and the Southeast Energy Efficiency Alliance, put considerable effort towards creating an energy efficiency alliance between 2010 and 2013 that has not come to fruition. Progress on this in the absence of clear interest and initiative from utility providers and funding support may be difficult. In the short term, less ambitious efforts such as focusing on commercial and municipal buildings and focusing on other recommendations provided in this plan may be preferable to attempting to create an alliance. Local staff working on sustainability initiatives have recently begun to more specifically explore collaborative possibilities; it's likely some new recommendation(s) will emerge.

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| Implementation Opportunities | Existing and new partnerships could support improved building energy efficiency, transportation, renewable energy, community scale composting, and environmental community goals. Examples of existing partnerships include Chapel Hill Transit/Partners Committee, OWASA, Chapel Hill-Carrboro City Schools, Orange County Solid Waste/Solid Waste Advisory Group, GoTriangle, Durham/Chapel Hill/Carrboro Metropolitan Planning Organization. Examples of new partnership opportunities include: creating a building energy efficiency alliance; expanding car/bike/ride sharing and transit services; partnership at the nexus of water supply and wastewater/energy; stormwater utility across municipal boundaries; county/regional scale sustainability partnership (either general or more focused, e.g., on public buildings and/or renewable energy installations); downtown geothermal partnership. |
| Implementation Challenges | Attempt through WISE program to create Regional Energy Alliance was unsuccessful and indicates general challenges in working in buildings sector Unclear as to interest from others in partnering Town has limited capacity to investigate and work with local partners to pursue these programs on its own. New funding may be needed in some cases |
| Resources Needed (human and material) | Staffing and funding |
| Anticipated Cost | Cost of additional staffing/contracting to coordinate |
| Leadership | Board of Aldermen; staff managers; staff |
| Partners (selected) | Chapel Hill-Carrboro City Schools, UNC Sustainability Program, Orange County Solid Waste Program, Chapel Hill Sustainability Committee, OWASA, NC Botanical Gardens |
| Fit with Items | Many of the other recommendations depending on details |
| Time Frame | Exploration can begin immediately. Some partnerships will take longer to develop. |
| Next Step(s) | Staff and Board of Aldermen to consider in development of FY 2016/17 budget cycle and community champions to self-identify |
| Evaluation Criteria | Track adoption of efficiency measures incentivized by programs facilitated/supported by the Town. |

Community Integration Recommendation #3: Create Green Neighborhood Program

Create Participatory Green Neighborhood Budgeting Program to Reduce Carbon Emissions, Build Community, Save Money and Reallocate Savings to New Green Project Initiatives

It is proposed that Carrboro create a new program that will identify projects to offer neighborhoods that will save the Town money and make the neighborhood's proportion of saved monies available to them to reallocate to new green project initiatives through a participatory democracy process.

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| Implementation Opportunities | <ul style="list-style-type: none"> • Enlists and engages neighborhoods in efforts to reduce CO₂ emissions in community-at-large • Builds community within neighborhoods • Neighborhood based economic development opportunities may spin-off • Possibility of creating a community scale "dashboard" that tracks energy use/emissions/savings • Recycling and composting successes translate into savings associated with less frequent trash pick-ups • Composting reduces trash headed for the landfill = cost savings + reduced methane gas • Neighborhood competitions awards program • Can boost initiatives such as Solarize; Energy Efficiency / Pete Street; Street Lights off for Climate t Project |
| Implementation Challenges | <ul style="list-style-type: none"> • Identification of mechanism for Town to allocate saved funds to neighborhoods • Development of participatory democracy process and criteria for new green project initiatives • Marketing for participation of neighborhoods • Availability for multi-family complexes? |
| Resources Needed (human and material) | <ul style="list-style-type: none"> • Full time person managing neighborhood portfolios and facilitating neighborhood efforts • Common spaces per neighborhood (i.e. for centralized neighborhood composting, solar panels, etc.) • Educational campaign on opportunities for greening ones neighborhood |
| Anticipated Cost | <ul style="list-style-type: none"> • Cost of full time person in charge of managing program • Marketing |
| Leadership | Neighborhood leaders |
| Partners | <ul style="list-style-type: none"> • Homeowner associations • Solarize Carrboro • Clean Energy Durham • Former Pete Street participants? • Town <ul style="list-style-type: none"> • Sustainability coordinator • Rec and Park (Clean Energy Durham Pete Street Effort) • Public Works |

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| | <ul style="list-style-type: none"> • Businesses <ul style="list-style-type: none"> • Fitch • Solar installers • Weatherization installers • Fifth Season/other local nurseries • Local landscapers • Non-profits • Orange County Solid Waste Management – composting |
| Time Frame | Will depend on identification of leadership |
| Fit with Items | Many of the other recommendations |
| Next Step(s) | <ol style="list-style-type: none"> 1. Presentations laying out town's CO₂ responsibilities as measured through social equity lens and the urgency of CO₂ reduction per the latest science <ul style="list-style-type: none"> • Town-wide initial presentation followed by • Presentations to neighborhoods that want to engage in green neighborhoods initiative 2. Create process for developing further program ideas and mechanism for neighborhoods to initiate <ul style="list-style-type: none"> • Set neighborhood CO₂ reduction goals in line with town's at large goal • Town recognizes savings achieved through existing green initiative successes and allocates these for neighborhoods to use proportional to neighborhood's impact in making the savings. (recurring) • Identify further potential programs and their contributions to reducing CO₂ for the neighborhood (ongoing) • Develop neighborhood green participatory democracy process and criteria for new green project initiatives • Develop way for town to allocate funds • Support and facilitate neighborhoods participation 3. Awards program for neighborhoods achieving biggest reductions per energy sector (Trash, Transportation, Housing) 4. On-street parking park and ride permits? |
| Evaluation Criteria | People reached. Energy saved. \$ reallocated. |

Community Integration Recommendation #4: Integrate Climate Action with Local Living Economy

Integrate Climate Action Implementation Opportunities identified in this Plan into the Update of the Local Living Economy Task Force Report

From 1990 to 2008 the rise in emissions from goods produced in developing countries but consumed in industrialized countries was six times greater than the emissions savings of industrialized countries. The international transportation of goods is not formally attributed to any nation and countries are not responsible for pollution produced by the manufacturing of goods that are shipped to their shores; those are attributed to the country where the goods were produced.

The Carrboro Local Living Economy Task Force Report enumerates many reasons for why support of locally owned businesses is vital, including that locally owned businesses have less environmental impact. This recommendation goes identifies some of the means by which both locally owned businesses and a habitable climate can be simultaneously and further supported.

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| Implementation Opportunities | Integrate implementation opportunities into the update of the Local Living Economy Task Force report: 1) Include climate change mitigation in local living economy/locally owned marketing messaging 2) Encourage light manufacturing zone in Carrboro, 3) Set-up PACE program for commercial buildings to implement renewable energy. |
| Implementation Challenges | Time is running out to mitigate climate change! |
| Resources needed | New Town Sustainability Coordinator |
| Anticipated cost | Cost of hiring additional staff person |
| Leadership | <ul style="list-style-type: none"> • Town of Carrboro • Carrboro Business Alliance, • Town businesses |
| Partners | <ul style="list-style-type: none"> • Carrboro Economic Sustainability Commission, • Carrboro Economic Development department, • Carrboro Business Alliance, • County -- ¼ cent sales tax economic development monies |
| Time Frame | Some steps can be pursued immediately, others will take longer |
| Fits with items | <ul style="list-style-type: none"> • Local Living Economy Task Force report and update, • Implementation of locally owned first campaign, • Downtown geothermal heating district • Commercial energy improvement revolving loan fund |
| Next steps | Further develop each identified implementation opportunity |
| Evaluation criteria | The locally owned economy campaign is understood as also being a climate change mitigation strategy by the Carrboro community |

Community Integration Recommendation #5: Expand Capacity

Expand Staff and Community Capacity to Pursue Community Sustainability Initiatives

Expanded Town and community capacity are needed to implement this plan. A strong recommendation of this plan is that the Town hire a Sustainability Coordinator charged with helping implement the plan. In conjunction with expanded staff capacity, a new Task Force/Advisory Board could be formed with responsibility for overseeing community climate action efforts; the Coordinator could staff this Task Force. The above recommendations (1-4) along with additional recommendations in the sections that follow in this plan will also support expanded community capacity. An online resource hub could also be created.

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| Implementation Opportunities | Additional staff could facilitate non-profit/ business partnerships to improve energy efficiency in the community, and to publicly recognize successes. A sustainability coordinator could more effectively pursue grants. |
| Implementation Challenges | <ul style="list-style-type: none">• Currently, Town has limited capacity to investigate and work with local partners to pursue these programs.• Ability of community advocates to organize• Community organizing requires dedicated volunteers; not clear if sufficient interest exists• Funding to help residents interested in retrofits• Staff capacity is currently limited to support a new advisory board/task force |
| Resources Needed (human and material) | Additional community volunteers and staff capacity |
| Anticipated Cost | Cost of hiring additional staff. |
| Leadership | Board of Aldermen, Town staff (ideally a Sustainability Coordinator), and community volunteers |
| Partners | None specific to this recommendation |
| Time Frame | FY 2016/17 budget cycle to hire sustainability coordinator |
| Fit with Items | Many of the other recommendations |
| Next Step(s) | Staff and Board of Aldermen to consider in development of FY 2016/17 budget cycle and community champions to self-identify |
| Evaluation Criteria | Track adoption of measures facilitated/supported by the Town. |

Community Integration Recommendation #6: Facilitate Low Cost Financing for Energy Efficiency and Renewable Energy Projects

Obtain/use QECB Authority to Fund Upfront Costs and Obtain Preferable Long Term/Low Cost Financing

Energy efficiency and renewable energy projects often require low cost/long term financing to be attractive since a short simple payback time can be hard to achieve; savings are realized over longer time frames. This recommendation has two parts. The first is to utilize Qualified Energy Conservation

Bonds (QECB), which potentially provide Carrboro and partners with access low-cost financing that help projects become financially viable. The second is to make this low-cost financing available for community projects using a revolving loan fund or Property Assessed Clean Energy (PACE) financing.

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| Implementation Opportunities | <p>Many of the recommendations listed in this report require low-cost financing. For example, QECBs could provide seed funding for</p> <ul style="list-style-type: none"> • efficiency improvements to public buildings • a revolving loan fund for community projects • Property assessed clean energy (PACE), a program where the loan is paid using assessments on the property tax bill • low cost financing for home energy efficiency projects for community members who have difficulty qualifying for traditional financing |
| Implementation Challenges | <ul style="list-style-type: none"> • Reluctance to take on debt • Clarity about how to use the complex QECB such that the bond issuance will be supported through the state/federal approval process • Capacity and expertise to issue bonds • Community financing via PACE or a revolving loan fund can have low community participation because (i) onerous loan application process requiring a lengthy municipal approval process, and (ii) maximum loan amounts that are set too low to fund an entire project with one loan. |
| Resources Needed | <ul style="list-style-type: none"> • Bond issuance process can be lengthy and the Town would need expertise • Would be coordinated with other programs that need financing |
| Anticipated Cost | The cost of low interest debt financing |
| Leadership | While QECBs have been used in municipalities outside of NC, within North Carolina these bonds have been limited to agricultural programs. There would be some learning required by the Town to get the bonds issued. Also, a PACE program has not yet been implemented by any NC municipality. |
| Partners | NC Clean Tech Center, UNC Environmental Finance Center, other local governments |
| Fit with Items | Many recommendations could benefit from low-cost financing |
| Time Frame | Exploration could begin immediately. For a higher probability of moving forward, either a Sustainability Coordinator or championing by the county or another entity will likely be needed. |
| Next Step(s) | <p>Identify and/or recruit nonprofit organization/local champion to:</p> <ul style="list-style-type: none"> • Identify project/revolving loan fund that could benefit from QECB • Pursue bond issuing process |
| Evaluation Criteria | <ul style="list-style-type: none"> • Life cycle costs and net present value |

Community Integration Recommendation #7: Integrate Climate Action and Social/Equity Initiatives

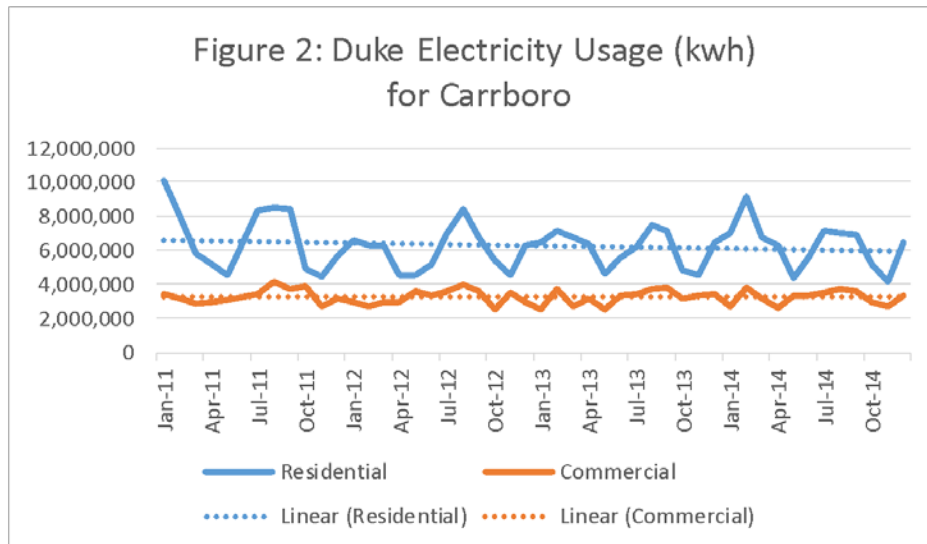
Low income households spend 24% of their income on energy costs. To make housing affordable, we must do more than just lower mortgage payments/rent. We also need to take a look at how to lower utility bills. The installation cost of solar has dropped precipitously in recent years and more and more middle and upper class households are taking advantage of this opportunity to both use clean energy and save money. However, the switch to solar is made easier by income tax credits and access to financing. Both of these are often not available for lower income/wealth households. The mechanisms to make energy more affordable are federal grants, community programs, and Town initiatives/ordinances.

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| Implementation Opportunities | <ul style="list-style-type: none">• Grants: In July 2015, the federal government announced increased grant and loan guarantee funding for solar installations on "federally assisted housing". This includes HUD's rental housing portfolio (Public Housing, Multifamily Assisted) and USDA's Rural Development Multifamily Programs, as well as rental housing supported through the Low Income Housing Tax Credit (LIHTC). More information is available at the HUD exchange webpage: www.hudexchange.info• Community programs: Community programs have worked to improve energy efficiency and renewable energy access for low-income communities. One example is <i>Grid Alternatives</i>, a non-profit that develops solar for low-income, single family homes by deploying donated materials and simultaneously running a training program to complete the installation. The result is lower energy costs and a more skilled workforce. Another example is <i>Grid Free NC</i>, a solar company in Chatham County that has partnered with Habitat for Humanity to develop solar for low income families.• Town initiatives/ordinances: When assessing affordability, include the utility costs. Town-led initiatives that improve affordability and livability are preferred over bare-minimum construction. Efficiency improvements with little monetary benefit are not preferred. For new development or substantial retrofits, the Town could offer leniency on other requirements in exchange for improvements to energy efficiency. For example, the Town could offer a density bonus or fewer required parking spaces in exchange for meeting a higher standard of energy efficiency. |
| Implementation Challenges | <ul style="list-style-type: none">• Requirements and construction standards seek to improve the safety and longevity of buildings. However, such requirements should be crafted with care, as increases in cost of construction or delays in the approval process can make housing less affordable.• Federal grants only cover a small portion of affordable housing units. |
| Resources Needed | <ul style="list-style-type: none">• Grant applications development• Facilitating community programs through seed or matching funding |

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| Anticipated Cost | Variable, depending on Town commitment |
| Leadership | Town staff and community programs |
| Partners | Federal government, community programs, Triangle Green Building Council |
| Fit with Items | Works to address both affordable housing and climate change mitigation |
| Time Frame | Coordination with affordable housing focused efforts can be explored immediately. Significant traction is a long term proposition. |
| Next Step(s) | <ul style="list-style-type: none"> • Identify relevant federal grants • Develop partnerships with community programs • Investigate legal authority and cost-benefit analysis for Town ordinances |
| Evaluation Criteria | <ul style="list-style-type: none"> • life cycle costs and net present value |

Building Energy Efficiency Measures

Residential and commercial buildings are the largest emissions sectors in Carrboro, accounting for 2/3 of all emissions. Duke Energy has been able to provide monthly electricity use data specifically for Carrboro beginning in January, 2011 through the end of 2014, broken out by residential and commercial accounts. An analysis of this data (Figure 2) indicates that residential electricity use declined by about 1% per annum during this time, while population increased by about 2% per annum. Commercial use remained very stable. The residential use also has a sharp seasonal pattern, with winter and summer peaks presumably associated with heating and cooling loads. If a downward trend can be accelerated through the recommendations below, it will be very beneficial to pursuing the overall reduction targets. Any ability to determine how representative the trend is of years prior to 2011 would also be beneficial to the monitoring of overall progress.



Energy performance rating/audit requirements can inform interested parties on the overall energy efficiency of the building and provide transparency for market based decisions about property sales and rentals. By influencing a property's appeal to future renters and buyers, required ratings can serve as an incentive for building owners to improve energy efficiency. This approach is being tested in cities such as Seattle, WA, Portland, OR, and Austin, TX. A website tracking different jurisdictions efforts for policies, improvements, and benchmarking in energy efficiency can be found at <http://www.buildingrating.org/jurisdictions>.

It is recommended that owners of existing buildings be required (ideally) or at least encouraged to provide the results of an energy audit and/or an energy performance rating (including one year of utility bills) at the point of building sale or lease. This could be in the form of a written document and/or a numerical score such as a HERS rating or other recognized format. The requirement could include potential/recommended energy efficiency improvement measures. It is likely that Carrboro would need to acquire statutory authority from the State for any requirement. For new buildings and improvements requiring a building permit, pending outcome of request for statutory authority, the Town could implement a section of the Building Code¹⁶ with additional energy efficiency requirements that the Town is not currently implementing. Alternatively, the Town could partner with Triangle Green Building Council to develop an optional checklist of efficiency performance/measures that, if implemented, would lead to special designation and public recognition.

Most Carrboro residents rent their homes; 33% of homes are owner occupied, compared to 59% renter occupied (the remaining 8% of homes are vacant)¹⁷. While some reductions can be achieved via low

¹⁶ At the December 14, 2010 NC Building Code Council meeting, a 15% residential efficiency part of the code was not approved, instead this code was considered to be voluntary and included as Appendix 4 to the 2012 NC Energy Conservation Code. The Carrboro Board of Aldermen is seeking statutory authority to pilot making Appendix 4 mandatory.

¹⁷ UNC Capstone Team, 2015. 2012 Greenhouse Gas Emission Inventory for the Town of Carrboro, NC. <http://nc-carrboro.civicplus.com/DocumentCenter/Home/View/2788>

cost/no cost approaches, to achieve substantial (>10%) GHG reductions, retrofitting or including energy efficiency improvements during rehab work is typically necessary. For many rental properties, renters pay the utility bills and as a result, building owners/landlords may have little or no financial incentive to pursue this work. Conversely, renters have no financial incentive to make investments in a property they do not own. Accordingly, there is an underinvestment in energy efficiency improvements in rental units. Without aligning the landlord's costs for retrofits and the renter's benefit in lower energy bills, it will be difficult to voluntarily achieve GHG reductions in rental units. Addressing this issue requires engagement of a diverse set of stakeholders: affordable housing advocates, renters, landlords, new development planners, and energy efficiency contractors. It is recommended that the Town commission a Task Force to bring forward policy recommendations for how to align landlord and renter interests towards achieving energy efficiency in rental units. The Town could also create a voluntary registry or certification program that landlords could include in the advertisements of their properties. This could be in the form of a certification or a points system.

Buildings Recommendation #1: 50% Challenge

Reduce Emissions Attributed to Carrboro Buildings by 50% by 2025

It is proposed that local leaders announce an emissions reduction challenge to reduce community wide emissions by 50% by 2025. The challenge could include a component focused on buildings emissions in Carrboro.

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| Implementation Opportunities | Reduced electricity and gas use from more efficient building envelopes, appliances, HVAC systems, lighting. Healthier buildings; older buildings brought up to code; utility cost savings for building owners/occupants. If the private sector becomes engaged, the downtown area of Carrboro and Chapel Hill could evolve into a recognized "2030 District" ¹⁸ |
| Implementation Challenges | "Cost, complexity, inertia". High percentage of non-owner occupied buildings; financial challenges especially for lower income residents and renters. |
| Resources Needed (human and material) | A nonprofit organization to become a community champion. Neighborhood and business champions and grassroots/community organizing, outreach, and education. Broad support from community leaders, utilities, financiers, and contractors. Potentially, fiscal support for nonprofit and organizing/coordination support from Board and staff |
| Anticipated Cost | Time and potentially salary involved in organizing; more efficient buildings result in cost savings and support the green building sector |
| Leadership | Potential leaders include: existing and/or new nonprofit(s); the Carrboro Business Alliance; Chamber of Commerce; Triangle Green Building Council |

¹⁸ <http://www.2030districts.org/>

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| Partners | <p>Potential partners include: existing and/or new nonprofit(s); the Carrboro Business Alliance; Chamber of Commerce; Triangle Green Building Council</p> <p>Several programs have been developed in North Carolina to lower the barriers to energy efficiency adoption within a community.</p> <ul style="list-style-type: none"> • The NC Banker's Association pools banks for the financing of low income tax credit apartment complexes. They are interested in partnering with nonprofits to start a small loan pool for energy retrofits.¹⁹ • System Vision program, which partners Advanced Energy Corp, the Self-Help Credit Union, and the NC Housing Finance Authority to finance green home construction/retrofits.²⁰ • Transition Streets and Pete Street programs.²¹ <p>The State Energy Office and Cooperative Extension Service ran the E-Conservation Home Energy Improvements program, which expired in July, 2015. If it is not renewed, it is recommended that Carrboro discuss partnering with Chapel Hill, Orange County, and perhaps others to run a similar program. The State Energy Office has been pursuing this for several years and is a valuable resource for learning what works.</p> |
| Time Frame | It is recommended that local leaders do this immediately. |
| Fit with Items | Renewable energy and transportation challenges |
| Next Step(s) | Local elected officials/community leaders collaborate to initiate challenge |
| Evaluation Criteria | Reductions in energy use/GHG emissions from buildings. Updated community energy use/emissions inventories for 2016 and 2020 |

Buildings Recommendation #2: Require Energy Audit/Performance Rating

For Existing Buildings, Require an Energy Audit and/or Building Energy Performance Rating, Including Utility Bills from Past Year, at Point of Sale or Lease.

An energy audit is a service that involves inspecting and analyzing energy use, efficiency, and conservation. Different types of audits can be pursued, from simple "walk through" audits to more involved audits that can use equipment (such as blower doors and infrared cameras). A building performance rating is the result of an analysis that rates a building on a standardized scale for buildings of the same type. For example, for homes, the Home Energy Rating System (HERS) is a national

¹⁹ Contact is Michelle Lampert shellielampert@gmail.com

²⁰ <http://www.nchfa.com/nonprofits/HPsystemvision.aspx>

²¹ In 2013 Carrboro and Chapel Hill contracted with Clean Energy Durham to pilot their "Pete Street" neighbor-to-neighbor energy retrofit program. The approach trains neighborhood volunteers who lead neighborhood workshops where small groups of resident learn simple energy savings projects and behaviors. Clean Energy Durham has recently closed.

recognized rating system. EPA's Energy Star program similarly has created a system for rating and benchmarking different categories of buildings. The purpose of this recommendation is to create a level playing field using recognized standards of information about energy use and efficiency for people in the housing market.

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| Implementation Opportunities | <ul style="list-style-type: none"> · Healthier buildings (better air handling and moisture control) · Lower carbon emissions. · Lower utility bills for occupants. · Provides a service to those looking to buy or rent and reaches a demographic not reached with many incentive based efforts · Addresses the unique situation in Carrboro with a high percentage of non-owner occupied buildings · Heat loss audits could be automated for a neighborhood using thermal IR imagery · The Town's Energy Efficiency Revolving Loan Fund is available for recommended improvements to commercial buildings. · Can potentially support businesses performing energy ratings/audits |
| Implementation Challenges | <ul style="list-style-type: none"> · It is likely that the Town does not have the authority to make this a requirement and would need special enabling legislation. · Some building owners, especially those with less efficient buildings, will likely not be in favor of this for reasons of "over regulation" and/or the potential market implications. |
| Resources Needed (human and material) | Assuming the Town could obtain authority, there would be effort associated with outreach and education and crafting the details with stakeholders as well as monitoring for compliance. |
| Anticipated Cost | Significant costs are not anticipated but would need to be determined as part of implementation |
| Leadership | Board of Aldermen for policy direction, with support from the Economic Sustainability Commission, Town staff |
| Partners | Business Alliance, Chamber of Commerce, Board of Realtors, Triangle Green Building Council |
| Time Frame | Exploration could begin immediately. For a higher probability of moving forward, either a Sustainability Coordinator or championing by or another entity will likely be needed. |
| Fit with Items | Rental Task Force; Rental Registry/Certification |
| Next Step(s) | Staff to confirm that legislation is needed and Board to seek enabling legislation |
| Evaluation Criteria | Reductions in metered utility energy usage and costs. |

Buildings Recommendation #3: Demonstrate/Pursue Energy Performance Beyond Minimum Requirements for New Development

For New Developments and/or Individual New Buildings or Major Retrofits, Require Compliance with Voluntary Section of Building Code, or Request Specific Energy Performance Rating/Measures as Part of Land Use and/or Building Permit.

In 2010, a 15% residential efficiency part of the building code was not approved by the NC Building Council, instead this code was considered to be voluntary and included as Appendix 4 to the 2012 NC Energy Conservation Code. The Carrboro Board of Aldermen is seeking statutory authority to pilot making Appendix 4 mandatory. In the absence of this authority, or if a different approach is chosen, other approaches could be followed to pursue energy efficiency in new buildings beyond the current minimum code requirements.

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| Implementation Opportunities | Healthier buildings (better air handling and moisture control) Lower carbon emissions. Lower utility bills for occupants. |
| Implementation Challenges | Additional Town staff time. Statutory authority, or voluntary compliance from developers/builders |
| Resources Needed (human and material) | Town staff to expand Building Code implementation and/or work with Triangle Green Building Council to develop checklist and form of recognition. |
| Anticipated Cost | No significant cost anticipated |
| Leadership | Town staff, potentially with support from Planning Board |
| Partners | Triangle Green Building Council |
| Time Frame | Exploration could begin immediately. For a higher probability of moving forward, either a Sustainability Coordinator or championing by the county or another entity will likely be needed. |
| Fit with Items | Pursuing 50% reduction |
| Next Step(s) | TBD |
| Evaluation Criteria | Number of buildings affected. Reductions in metered utility energy usage and energy intensity (energy use per square foot) |

Buildings Recommendation #4: Create Rental Property Task Force and Process

Create a Task Force to Pursue a Facilitative Process to Achieve Greenhouse Gas (GHG) Reductions in Rental Units

Most emissions in Carrboro come from buildings, a very high percentage of buildings are for housing and about two-thirds of housing in Carrboro is rental property. For progress towards Carrboro's Climate Action Goal, it is imperative that emissions reductions efforts address rental property. It is recommended that the Town commission a Task Force to bring forward policy recommendations for how to align landlord and renter interests towards improved energy efficiency in rental units. (This Task Force could be the same as identified below for renewable energy.)

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| Implementation Opportunities | <ul style="list-style-type: none"> • Energy efficiency reduces waste and saves money in the long term • Energy efficiency retrofits create local jobs |
| Implementation Challenges | <ul style="list-style-type: none"> • There is little precedent; organizing and coordinating will require significant effort. • Many rental property owners are not local. • Owners and renters financial incentives are not necessarily well aligned |
| Resources Needed (human and material) | Town staff could partner with an outside organization to facilitate this Task Force. |
| Anticipated Cost | Staff time and/or contract support to help facilitate task force |
| Leadership | Town staff for giving the group a well-defined mission and keeping the group on track |
| Partners | Work with organization that facilitates stakeholder groups |
| Time Frame | Time frame to set up a Task Force depends on Board priority and staff/community capacity. Operating the resulting program would be a long term endeavor. |
| Fit with Items | 50% reduction challenge; Rental Registry; Renewable Energy Task Force |
| Next Step(s) | <ol style="list-style-type: none"> 1. Develop Task Force charge 2. Identify relevant stakeholders needed to agree to process in order to make impactful change 3. Identify outside organization to facilitate Task Force 4. Commission Task Force |
| Evaluation Criteria | Savings from lower energy bills could be put towards other projects. Keep energy dollars local. Reduces greenhouse gas emissions. |

Buildings Recommendation #5: Create Rental Property Registry/Certification

Create a Certificate Program or Registry for the Energy Performance of Rental Housing

The basis for this recommendation is identical for the above building recommendations. The essence of this recommendation is that, as part of making rental properties more energy efficient, a program be created that makes it easy for those in the rental market to find energy efficient rental listings.

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| Implementation Opportunities | <ul style="list-style-type: none">· Lower residential carbon emissions.· Lower utility bills for tenants.· Provides a service to those looking to rent and reaches a demographic not reached with many incentive based efforts· Addresses the unique situation in Carrboro with a high percentage of non-owner occupied housing· The Town could potentially support performing energy ratings/audits |
| Implementation Challenges | <ul style="list-style-type: none">· The Town does not have the authority to make this a requirement.· The effectiveness of this program would be dependent on widespread adoption by Carrboro landlords.· It may require outreach to the landlords and research on the how to best communicate a potential rating system. |
| Resources Needed (human and material) | Town staff (potentially a Sustainability Coordinator), or another entity, could run the program and set the program requirements. |
| Anticipated Cost | Costs would be primarily associated with staff time and marketing. |
| Leadership | Board of Aldermen for policy direction, Town staff |
| Partners | Triangle Green Building Council, potentially others |
| Time Frame | Time frame to set up depends on Board priority and staff/community capacity. Operating it would be a long term endeavor. |
| Fit with Items | Other buildings recommendations, especially the energy audit/performance rating and Task Force recommendations |
| Next Step(s) | Policy/management feedback |
| Evaluation Criteria | Reductions in metered utility energy usage and costs. |

Transportation Measures

Reducing emissions from transportation in Carrboro will rely on a coordinated, multifaceted effort involving infrastructure improvements, additional transit service, land use changes, outreach and engagement to affect transportation mode choices, and participation broadly with partners and across the community.

Availability of local bicycling and pedestrian infrastructure is strongly associated with overall levels of biking and walking, especially with trips to work, school, or shopping.²² In September 2010, the League of American Bicyclists recognized Carrboro as a Bicycle Friendly Community at the “Silver” level. There is an aspiration to achieve the “Gold” level during the next review cycle. The Town has the support of the Carrboro Bike Coalition, Chapel Hill Carrboro City Schools and other Safe Routes to Schools partners, a high level of ridership relative to other jurisdictions, and comprehensive bicycling and greenway plans. In order to get even more people out of their cars and onto their feet and bikes, Carrboro must keep working on the gaps, continue to connect neighborhoods to schools, and expand bicycle and pedestrian infrastructure to connect all areas of Carrboro to downtown, surrounding greenways, and bike routes. Improvements such as signals and pavement markings can increase convenience and perceptions of safety, and provide official, visible recognition that bicyclists are legitimate users of the road.

Carrboro (and Chapel Hill and UNC) have sponsored Chapel Hill Transit for several decades, the only fare free transit system and the highest per capita use system in North Carolina. In combination with regional transit provided by GoTriangle, transit options, along with publically and privately supported rideshare/carpooling/vanpooling/car sharing options continue to increase. Nevertheless, for many users and trips, transit and other alternatives to single occupancy vehicle use is a difficult option because of the relative convenience and comparative time relative to single occupancy motor vehicle use. A number of initiatives are in place to help promote and expand use of alternatives to single occupancy vehicle use; suggestions for further pursuing these initiatives are provided. A final recommendation is to reduce vehicle idling in school loading zones.

²² A Seattle study found that adults living within a half-mile of a bike path were 20 percent more likely to bicycle at least once a week. A Portland study found that cyclists went the furthest out of their way to use off-street bike paths, followed by bicycle boulevards (low speed streets that have been “optimized” for bicycle traffic) suggesting a general preference for facilities protected from motor vehicle traffic.

Transportation Recommendation #1: 50% Challenge

Reduce Greenhouse Gas Emissions from Motor Vehicle Use by 50% by 2025.

It is proposed that local leaders announce an emissions reduction challenge to reduce community wide emissions by 50% by 2025. The challenge could include a component focused on transportation/motor vehicle emissions in Carrboro.

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| Implementation Opportunities | <ul style="list-style-type: none">• Requirements and market for more fuel efficient/lower emission vehicles and pedestrian and bicycle infrastructure and transit system use continue to improve.• Land use planning is supporting mixed use, infill and redevelopment and community is proactive to further encourage non-vehicular modes. |
| Implementation Challenges | <ul style="list-style-type: none">• High percentage of residents work outside Carrboro with significant challenges for using transit or commuting by bike or on foot.• Constraints such as topography/natural features, ownership, and grey infrastructure exist in some areas for further bicycle and pedestrian facility development.• Non-vehicular transportation options in some parts of Town are more limited.• Ability to monitor and track progress towards emissions reduction is currently quite limited methodologically and in terms of clarity of the responsible party for tracking. |
| Resources Needed (human and material) | There are no resource requirements associated with a recognized community wide goal, although there will be resources needed for implementation of different actions. |
| Anticipated Cost | There are no specific costs associated with a recognized community wide goal, although there will be resources needed for implementation of different actions. |
| Leadership | Local elected officials and community leaders could endorse this goal |
| Partners | Various public, private, nonprofit |
| Time Frame | It is recommended that local leaders do this immediately. |
| Fit with Items | Buildings and renewable energy challenges |
| Next Step(s) | Formal adoption/publicity for challenge |
| Evaluation Criteria | Ability to track emissions via VMT, fuel type, and vehicle efficiency. CAMPO model? Other methodology? |

Transportation Recommendation #2: Improve Bicycle and Pedestrian Infrastructure

Improve and Extend Carrboro's Bicycling and Pedestrian Infrastructure

Significant federal and state funding exists to support greenways development. Local matching funds to access the federal/state funds for later phases of both the Bolin and Morgan Creek greenways have not been identified. Local fundraising has been successful in many areas and provides an opportunity to unite the whole community for a good cause. To go after funds, the Town of Carrboro needs to approve a route and alignment for phases 3 and 4 of the Bolin Creek greenway, or a north/south greenway connector that can meet the same goals within a similar time frame. Carrboro has a new fiscal challenge because of the recent expiration of sidewalk and greenway bond funding.

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| Implementation Opportunities | Greenway and bike plan project implementation could be accelerated, providing off road options to more users sooner than likely with current efforts. |
| Implementation Challenges | <ul style="list-style-type: none"> • Limited funding identified for greenway and sidewalk projects (especially the local match; existing bond funds recently expired). • Leadership, capacity, and commitment to resolve conflicting community positions on alignment for future phases of the Bolin Creek greenway or a North South connector. • Uncertain/delayed development plans delaying greenway implementation for State property in northern Carrboro. • Coordinating with multiple entities. |
| Resources Needed (human and material) | <ul style="list-style-type: none"> • Town Staff and other support to implement. • Funding for greenway development and new bike and pedestrian facilities. |
| Anticipated Cost | TBD |
| Leadership | Board of Aldermen and Town Staff with support from the Transportation Advisory Board, the Greenways Commission, and the Carrboro Bike Coalition. |
| Partners | NCDOT, Town of Chapel Hill, Chapel Hill-Carrboro City Schools, Local Business Community, BikeWalk NC. |
| Fit with Items | Reduce greenhouse gas emission from motor vehicle use by 50% by 2025. |
| Time Frame | Some elements have begun, and could be accelerated depending on the priority of the parties involved. Infrastructure development/improvement by nature is an ongoing and long term undertaking. |
| Next Step(s) | <ul style="list-style-type: none"> • Connect northern Carrboro to downtown areas by dedicated/safer bike routes to include on and off road improvements (more below). • Prioritize the completion of a North South greenway connector in northern Carrboro and the Morgan Creek Greenway. In order to do this, Carrboro needs to: <ul style="list-style-type: none"> ○ Formally approve a route/alignment for a North South greenway connector. This could be phases 3 and 4 of the Bolin Creek plan or an alternate greenway connector that can meet the same goals within a similar time frame. ○ Because of strong and differing positions by stakeholders, and limited information on options, we recommend that current staff or a hired |

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| | <p>consultant pull together research on alternatives and that the town bring in a professional facilitator to guide the decision process. (FY 16/17)</p> <ul style="list-style-type: none"> o Dedicate local matching funding (Board/staff to identify local match for Jones Creek greenway.) o Work closely with UNC since much of the planned greenway system crosses three separate tracts of land managed by UNC. (Specifically suggest that staff contact UNC staff for feedback on plans for future development.) ● Connect all Chapel Hill-Carrboro City Schools to surrounding neighborhoods by dedicated bike routes. ● Create bicycle boulevards by adding traffic calming features (e.g., speed humps, curb extensions, pedestrian crossways) on streets with a low volume of traffic and/or install cycle tracks (which are on-street bike lanes that are physically separated from motor vehicle lanes). This can be pursued in conjunction with stormwater treatment measures to create “Green Streets”. ● Consider new forms of pavement markings, including bike boxes, shared lane markings or sharrows, and colored bike lanes, which increase perceptions of safety, help guide bicyclists and motorists, and provide official, visible recognition that bicyclists are legitimate users of the road. ● Improve the pedestrian experience in and around bus stops. ● Provide bike parking at high-demand bus stops. ● Work with the local business community to provide showers and bike locker for commuters. ● In the longer term/larger community, ensure sufficient bike parking is supplied at future Light Rail stations. |
| Evaluation Criteria | <ul style="list-style-type: none"> ● Increase in the number of students biking or walking to school ● Increase in the number of residents biking or walking to work ● Increase in the number of bike trips to downtown Carrboro ● Completion of greenways and dedicated bike routes ● Completion of bicycle boulevards, cycle tracks, and new pavement markings ● Increase in the number of businesses that install showers and bike lockers |

Transportation Recommendation #3: Enhance Transit Service

Improve/Extend Transit Service

While overall, Chapel Hill Transit is the most successful transit agency in North Carolina and GoTriangle is steadily increasing service, areas farther from Town have limited service and GoTriangle does not have a stop in Carrboro to connect with other area job hubs.

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| Implementation Opportunities | <ul style="list-style-type: none"> ● Transit service could be extended to new areas by adding one or more stops in Carrboro well connected to other transit, bike, and pedestrian access, and including more hours of service. ● New Transit Oriented Development could be sited in the Northern Transition Area. |
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| Implementation Challenges | <ul style="list-style-type: none"> Fleet has many old and inefficient vehicles Funding is currently stressed. It is difficult to site development of sufficient density in northern Carrboro to justify transit. Service level makes it difficult for many commuters to use transit. |
| Resources Needed (human and material) | <ul style="list-style-type: none"> Increased funding Landowner, developer, and community support new mixed use/transit oriented development |
| Anticipated Cost | Improved local transit service costs will depend on different factors, and will be implemented by Chapel Hill Transit. |
| Leadership | Board/Transit Partners, NTAAC, Transportation Advisory Board, Town staff for new development. Chapel Hill Transit for improved/expanded local transit service; GoTriangle for regional transit. Other partners below can also provide leadership. |
| Partners | Local business community, NTA neighbors |
| Time Frame | Transit development/improvement by nature is an ongoing and long term undertaking. |
| Fit with Items | See separate recommendation for steps to promote transit service. |
| Next Step(s) | <ul style="list-style-type: none"> Work with GoTriangle and Chapel Hill Transit staff to provide additional feedback on plans for future service and ability to accelerate adding service, including both downtown Carrboro and Northern Carrboro. Enhance transit access points along the 15-501 corridor from Carrboro to Durham and provide more frequent, reliable bus service. |
| Evaluation Criteria | Number of bus commuters/trips |

Transportation Recommendation #4: Improve Vanpool/Carpool Options

Improve Vanpool/Carpool Options for Commuters

A considerable amount of transportation related emissions can be attributed to people commuting in and out of Carrboro for work. Vanpools and carpools can be an effective approach for reducing vehicle miles traveled and single occupancy vehicle trips, but existing park and ride areas could be more convenient for Carrboro commuters. Adding vanpool parking areas could reduce vehicle miles traveled and emissions.

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| Implementation Opportunities | Add GoTriangle vanpool/carpool parking in Carrboro (including downtown Carrboro and Northern Carrboro) and nearby in Chapel Hill. |
| Implementation Challenges | Requires partnership with GoTriangle and local businesses. |
| Resources Needed (human and material) | Signs to identify vanpool and carpool parking areas |
| Anticipated Cost | Signs to identify vanpool and carpool parking areas |
| Leadership | Board of Aldermen; Staff; GoTriangle |

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| Partners | Chapel Hill Transit, GoTriangle |
| Time Frame | The main timing consideration is determining who can champion this. |
| Fit with Items | Reduce transportation emissions by 50% by 2025. |
| Next Step(s) | Work with GoTriangle to identify currently registered vanpools and carpools and use this info along with expected increase in use to establish carpool and vanpool parking areas, including downtown Carrboro and Northern Carrboro and nearby areas in Chapel Hill. |
| Evaluation Criteria | Number of vanpool and carpool commuters |

Transportation Recommendation #5: Further Promote Walking, Biking, Transit

Take Additional Steps to Promote Walking, Biking, and Transit Use

Carrboro has a considerable base of bicycling, walking, and transit use to build on. In September 2010, the League of American Bicyclists named the Town of Carrboro a Bicycle Friendly Community at the “Silver” level, and there is an aspiration to achieve the “Gold” level during the next review. Carrboro has significant support from the Carrboro Bike Coalition and other partners and already participates in the Safe Routes to School program. Marketing and educational programs, as well as regulations, significantly affect levels of bicycling, walking, and transit use. Investments in infrastructure must be supported by outreach programs to be most effective.

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| Implementation Opportunities | More promotion/outreach for bicycling and walking |
| Implementation Challenges | <ul style="list-style-type: none"> • Challenge of changing set behaviors. • Some greenway, bike route, and transit services are not yet complete. • Transit services are spotty or non-existent in some areas • Uncertain funding for new/renovated buses |
| Resources Needed (human and material) | <ul style="list-style-type: none"> • Town Staff and partners support. |
| Anticipated Cost | TBD |
| Leadership | Town Transportation Planner, with support from Recreation and Parks staff, Transportation Advisory Board, Greenways Commission. |
| Partners | UNC, Chapel Hill Transit, GoTriangle, Carrboro Bike Coalition, Carrboro Business Alliance, Chapel Hill-Carrboro City Schools, Walk Bike NC |
| Fit with Items | Reduce Greenhouse Gas Emissions from Motor Vehicle Use by 50% by 2025; Improve and Extend Bicycling and Pedestrian Infrastructure; Improve and Extend Transit Services |
| Time Frame | This is ongoing. The main consideration for significantly accelerating efforts is identifying people with capacity. |
| Next Step(s) | <ul style="list-style-type: none"> • Continue, accelerate, and intensify efforts to: <ul style="list-style-type: none"> o Promote bike to work days; consider doing these weekly. Studies have reported long-term increases in bicycling following bike-to-work days. o Work with the Carrboro Bicycle Coalition to put on and publicize on- |

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| | <p>going bicycle training.</p> <ul style="list-style-type: none"> o Work with the Carrboro Bike Coalition to hold “Open Streets” days. o Work with Chapel Hill Transit and GoTriangle to develop and implement a marketing and educational program on carpooling, vanpooling, and transit use. Promote official car free, carpool, vanpool, and transit use days. o Support the <i>Safe Routes to Schools Program</i>. Work with the Carrboro-Chapel Hill City School System and local PTAs to promote bike and walk to school days; consider doing these weekly. o Pursue efforts to implement land use and development policies that help ensure destinations for daily needs, such as school, work, and shopping, are within convenient bicycling distance from home. Encourage developers to promote multi-modal transportation options. <ul style="list-style-type: none"> ● Promote “park and stroll” programs at schools, where students are dropped off at a remote location and walk or bike the rest of the way to school. ● Research and implement a bike sharing system downtown. ● Explore new policies that make driving more expensive and less convenient (e.g. reduced parking supply, increased parking fees, and reduced road speeds). Lower speed limits for vehicles make bicycling safer and more attractive. One study conducted in Germany found that reducing general speed limits led to a significant increase in bicycling. |
| Evaluation Criteria | <ul style="list-style-type: none"> ● Number of students biking or walking to school. ● Number of residents biking, walking, or using transit, carpooling or vanpooling to commute to work. ● Increased transit ridership. |

Transportation Recommendation #6: Limit Idling in School Loading Zones

Modify Town Code to Limit Idling in School Loading Zones

Avoiding idling time has a multitude of benefits including: savings in fuel and maintenance costs, extending vehicle life, and reducing damaging emissions. It is especially appropriate to look at school loading zones because they are focal points in Carrboro for vehicle idling, expose a sensitive population to air pollution, and meaningful reductions could be achievable through simple behavior change.

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| Implementation Opportunities | This is a simple, straightforward fix to a widespread problem that will reduce air pollution and GHG emissions. |
| Implementation Challenges | Parental resistance, especially at elementary schools, and enforcement. |
| Resources Needed | School system employee and/or police officer time. Consider recruiting student and parent volunteers to help with education/outreach. |
| Anticipated Cost | Costs associated with staff time |
| Leadership | Board of Aldermen; CHCCS School Board |
| Partners | CHCCS and Town staff; PTA; individual school teams; TAB |
| Time Frame | If the policy direction exists, this could be pursued immediately. |
| Fit with Items | Community integration and emission reduction recommendations |
| Next Step(s) | Coordinate with CHCCS and/or modify Town Code |
| Evaluation Criteria | Monitoring of idling activity |

Renewable Energy Measures

Carrboro's Climate Action Goal can be pursued by generating more energy from renewable sources and improving energy efficiency. This section provides recommendations for how to increase renewable energy from two sources, solar and geothermal. Solar panels convert light from the sun into electricity. Geothermal heating and cooling employs pumps and wells to take advantage of the near constant temperatures below the Earth's surface. This can be used to reduce the costs to heat buildings in the winter and cool them during the summer. Both of these approaches require considerable initial costs to install the equipment. However these technologies have low maintenance costs and a lifetime of more than 25 years, which creates considerable energy savings over time. Homeowners and businesses that can shoulder the upfront costs have been switching to renewable energy. The focus of these recommendations is to help speed the transition to renewable energy, especially addressing the barrier of initial costs.

The Task Force's first recommendation is to develop a community solar project for Carrboro. Solar panels can provide low-cost energy without environmental impacts. Many home and business owners are realizing lower energy costs by investing in solar. However, most Carrboro residents either rent or own homes that are shaded by trees, and cannot benefit from solar at their home. A community solar project would allow people across Carrboro to invest in solar, lower electricity bills, and help bring about a clean energy future for our Town. However, the electric utilities that service Carrboro restrict most forms of community ownership. Legislation currently under discussion in the NC General Assembly would allow a third-party, such as a community entity, to sell electricity directly to power consumers. Under this change, a community group could own a solar installation and sell the energy to a large buyer, such as the Town of Carrboro. The agreement could set the electricity price to a rate that is beneficial to both the Town and the community investment group.

The Task Force's second recommendation is to create a downtown geothermal heating and cooling district. The Carrboro Century Center has considerable heating and cooling costs that could be reduced by switching to geothermal. Developing geothermal heating and cooling for the Century Center could reveal economies of scale, where neighboring buildings could be added to the system at lower cost. This recommendation is to explore the formation of a geothermal heating and cooling utility to provide low-cost, sustainably sourced heating and cooling to downtown buildings that is easy for property owners to join.

The third recommendation is to convene an action group to develop policy opportunities to create incentives for renewable energy and energy efficiency upgrades in rental properties ([see Buildings Recommendation #3](#)). The majority of Carrboro residents are renters and do not directly have control over their energy efficiency and energy generation. Because renters pay the utility bills, landlords have less financial incentive to invest in energy savings. Lowering electricity costs makes housing more affordable, but the incentives are not aligned to encourage this change. This action group will be charged with finding policy opportunities to better align renter and landlord incentives towards lowering electricity costs. This action group should include advocates from renter, property owner, affordable housing, and green building organizations.

When taken together, these recommendations provide opportunities for Carrboro residents and businesses to participate in and benefit from the switch to renewable energy.

Renewable Energy Recommendation #1: Pursue Community Solar Projects

Pursue Community Solar Projects

Solar panels can provide low-cost energy without environmental impacts. Many home and business owners are realizing lower energy costs by investing in solar. However, most Carrboro residents have homes that are shaded by trees, and cannot benefit from solar at their home. A community solar project would allow people across Carrboro to invest in solar, lower electricity bills, and help bring about a clean energy future for our Town. However, the electric utilities that service Carrboro restricts most forms of community ownership. Legislation currently under discussion in the NC General Assembly would allow a third-party, such as a community entity, to sell electricity directly to consumers. Under this change, a community group could own a solar installation and sell the energy to a large buyer, such as the Town of Carrboro. The agreement could set the electricity price to a rate that is beneficial to both the Town and the community investment group.

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| Implementation Opportunities | <ul style="list-style-type: none"> • Broadly share solar investment benefits, including keeping dollars local • Town of Carrboro buildings could be first adopters, but this approach could be deployed on other buildings • The community investment group would pay the upfront costs to develop solar (no financing support needed from the Town) |
| Implementation Challenges | <ul style="list-style-type: none"> • Requires considerable effort to organize support and investment • The loss of the NC Renewable Energy Tax Credit and the absence of third-party sales of electricity significantly limit the market. |
| Resources Needed (human and material) | Ideally, this would be pursued by Town staff in partnership with an outside organization to develop the community investment group. |
| Anticipated Cost | There are options depending on how the electricity purchasing agreement with the community group is defined |
| Leadership | Town staff for considering Town property; economic development groups for development of community infrastructure |
| Partners | Work with organization that coordinates community investment group |
| Time Frame | Projects could take months or more to develop and would have benefits for many decades |
| Fit with Items | Community Integration recommendations |
| Next Step(s) | Develop program with community investment group |
| Evaluation Criteria | Savings from lower energy bills could be put towards other projects. Keep energy dollars local. Reduces greenhouse gas emissions. |

Renewable Energy Recommendation #2: Create a Downtown Geothermal District

Create a Downtown Geothermal Heating and Cooling District

Geothermal heating and cooling employs pumps and wells to take advantage of the near constant temperatures below the Earth's surface. This can be used to reduce the costs to heat buildings in the winter and cool them during the summer.

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| Implementation Opportunities | <ul style="list-style-type: none"> • Lower costs of heating and cooling • Century Center could be candidate for first adopter • If marginal costs of adding adjacent community/commercial buildings to the heating and cooling network are low, then a municipal utility could be an effective way to provide services at low cost • A community geothermal utility would make it easier to adopt geothermal broadly by lowering costs and simplifying construction. • Savings from lower energy bills could be put towards other projects |
| Implementation Challenges | <ul style="list-style-type: none"> • Unknown technical feasibility • Large upfront costs; requires low-cost financing • New activity for Carrboro, but Orange County buildings in downtown Hillsborough have implemented geothermal heating and cooling and are realizing substantial savings |
| Resources Needed (human and material) | Effort to: explore feasibility; develop engineering design; and policy development towards an approach for other community buildings. |
| Anticipated Cost | Upfront costs are large but design lifetime of equipment is approximately 50 years. Geothermal systems (on average) reduce heating and cooling costs by 50%. The actual installation costs and benefits depend on the building. |
| Leadership | Town staff for development for Town buildings, business community for development of community infrastructure |
| Partners | Technical assistance from Orange County, contractor(s), and investors |
| Time Frame | An initial assessment of technical feasibility could be pursued quickly. Project development would likely take several years, depending on the scope, with benefits for many decades |
| Fit with Items | Pursue Partnerships; 50% Reduction Goal for Buildings |
| Next Step(s) | <ol style="list-style-type: none"> 1. Examine completed projects in Orange County 2. Solicit contracting support for feasibility study 3. If deemed feasible, develop preliminary design for Town of Carrboro buildings including financial assessment and environmental benefits. 4. Explore opportunities to develop a municipal utility 5. Explore ways to encourage developers to install geothermal |
| Evaluation Criteria | <ul style="list-style-type: none"> • Reduced energy bills. • Reduced greenhouse gas emissions. • More comfortable work environment for Town staff. |

Renewable Energy Recommendation #3: Create Rental Property Task Force and Process

Create a Task Force to Pursue a Facilitative Process to Achieve Greenhouse Gas (GHG) Reductions in Rental Units

It is recommended that the Town commission a Task Force to bring forward policy recommendations for how to align landlord and renter interests towards achieving renewable energy in rental units. (This Task Force could be the same as identified above for building energy efficiency.)

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| Implementation Opportunities | <ul style="list-style-type: none"> Renewable energy is clean energy and create local jobs |
| Implementation Challenges | <ul style="list-style-type: none"> The policy options to address this issue also have an impact on Town planning and affordable housing |
| Resources Needed (human and material) | Town staff could partner with an outside organization to facilitate this Task Force. |
| Anticipated Cost | Staff time and/or contract support to help facilitate task force |
| Leadership | Town staff for giving the group a well-defined mission and keeping the group on track |
| Partners | Work with organization that facilitates stakeholder groups |
| Time Frame | Time frame to set up a Task Force depends on Board priority and staff/community capacity. Operating the resulting program would be a long term endeavor. |
| Fit with Items | Task Force/Facilitative Process for Buildings |
| Next Step(s) | <ol style="list-style-type: none"> Develop Task Force charge Identify relevant stakeholders needed to agree to process in order to make impactful change Identify outside organization to facilitate Task Force Commission Task Force |
| Evaluation Criteria | Savings from lower energy bills could be put towards other projects. Keep energy dollars local. Reduces greenhouse gas emissions. |

Ecosystem Protection and Enhancement

The ecosystems that Carrboro is located within are being affected by a warming planet, but they also offer opportunities for combating climate change. The Task Force has identified recommendations to improve ecosystem health and resilience by reducing stormwater impacts, reducing deer herd pressure on forest health, increasing tree canopy and biodiversity, better management of invasive plants and encouragement of native plants, managing organic waste and improving soil quality. These focus areas are discussed separately, but are highly interwoven. The following is a brief overview of each area to provide context for our recommendations.

Climate change is likely to increase the frequency and intensity of storms and droughts in our area, which will in turn increase the negative impacts of stormwater runoff that include erosion, flooding, nonpoint source pollution, and altered hydrology²³. Many methods and opportunities exist to aid in curbing stormwater runoff (permeable paving, rain gardens, and green roofs to name just a few), but often landowner interest and available resources are not in place to pursue these projects²⁴. The Task Force recommends that the Town create a stormwater utility or join Chapel Hill's utility, thereby ensuring a dedicated funding source for stormwater projects that is not subject to discretionary spending in annual budget cycles. Doing so would provide the financial stability and predictability needed for such projects. A utility could also support public education, helping citizens understand the causes and consequences of stormwater runoff and the ways in which individuals can limit the polluted runoff leaving their property.

Local and other studies have shown that excess deer are adversely affecting the health of our forests by causing a decrease in plant diversity and aiding in the spread of exotic species. Soil studies have shown that the seed stores in areas with deer overpopulation are shifting from native wildflowers and woody plants to invasive plants and grasses. This threatens the ability of our forests to regenerate in a healthy way and continue to serve as diverse ecosystems and significant carbon sinks. Deer overpopulation needs to be better managed to reduce negative impacts on forest regeneration and ecosystem health and biodiversity. While several options exist for managing the density of deer herds, studies have found that the least expensive and most effective method is through culling programs, often focusing on an urban archery program that can be tailored to a community and also provide food to people in need. Such programs have been safely and successfully implemented in Duke Forest, Chapel Hill, and many other towns in North Carolina. The Task Force recommends that Carrboro implement its own program to protect our forests from an expanding deer population that is too large now and may grow.

Trees, whether lining a city street or part of a forest, are an important tool in addressing climate change. Carrboro's urban forest provides innumerable ecosystem services²⁵ (not just limited to climate protection/resilience and energy management) that affect both the local physical and social

²³ <http://tigerprints.clemson.edu/cgi/viewcontent.cgi?article=1131&context=scwrc>

²⁴ <http://www.nrdc.org/water/pollution/storm/chap4.asp>

²⁵ See Nowak, D. et al., "Sustaining America's Urban Trees and Forests". USDA Forest Service, Northern Research Station. State and Private Forestry General Technical Report NRS-62. June 2010.
http://www.fs.fed.us/openspace/fote/reports/nrs-62_sustaining_americas_urban.pdf

environment. Trees act as carbon sinks, reduce the heat island effect in urban areas, and reduce the energy used to cool and heat buildings. Trees stabilize and improve soil, reducing erosion and improving stormwater management through infiltration and evapotranspiration. Trees have been shown to increase property values and help to create a sense of community and economic vitality²⁴. Trees absorb air pollutants, reducing exposure of dangerous chemicals to people and wildlife. And, of course, trees offer habitat for wildlife, particularly pollinators and migratory birds. A recent study has shown that Carrboro lost about 4% of its tree canopy between 2002 and 2010²⁶. Considering the importance of trees, the Task Force recommends that the Town work with citizens to establish a tree coalition to promote the preservation and health of trees and the community forest in Carrboro and be a resource for citizens who have questions about trees on their property.

Unfortunately, native plant species are being overrun by invasive plant species (categorized by the US government as non-native species that are economically and environmentally devastating). Recent studies have shown that as climate change lengthens growing seasons, invasive species are adjusting their flowering schedules more quickly than their native counterparts. This earlier bloom time can allow invasives to shade out natives and “capture a larger share of nutrients, water, or pollinators”.²⁷ It can take decades to discover that a species is invasive, and such a discovery does not necessarily lead States to ban nursery sales of the species. Many people are unaware of the critical importance of native plants to food webs and biodiversity, and often fail to realize the impact that their own landscaping choices have on our local ecosystems. For example, because native plants serve as the host plants on which native insects lay their eggs -- and 96% of North American birds (excepting seabirds) rely on native insects to feed their young-- native plants are important both environmentally and economically. According to The White House, as of 2009, pollination of US crops by native insects was valued at more than nine billion dollars. The Task Force recommends the Town take a three-fold approach to this issue: 1) review and strengthen town ordinances against invasive species and in favor of native species; 2) educate the community about the link between native species and ecosystem health; and 3) encourage invasive species removal projects that are carried out by citizens but led by a non-profit or task force.

The Task Force recommends that the Town consider including curbside composting in future studies of and plans for waste management for multiple reasons. According to NCDENR, “landfills are the largest human-made contributor of methane into the atmosphere. Methane, a greenhouse gas, is 72 times more potent than CO₂ over twenty years.” The organic material buried in landfills is responsible for this methane, releasing the gas through anaerobic decomposition. Orange County has recently begun to utilize the methane in its landfill for energy production. At the same time, reducing future methane production at landfills is a positive climate mitigation measure. Composting is considered to be the most effective way to combat this production of methane²⁸. Orange County Solid Waste Management is scheduled to begin offering onsite disposal of household organic waste (i.e. food scraps) at its Chapel Hill facility on Eubanks Road in 2016. This will be in addition to the composting facility offered at its Walnut Grove Church Road Convenience Center in Hillsborough. However, many residents do not utilize

²⁶ Shields, Shane. 2014. Modeling Carrboro’s Tree Canopy Cover 2002 to 2010. Report completed as intern to Carrboro Planning Department.

²⁷ Nijhuis, Michelle. “How Climate Change is Helping Invasive Species Take Over.” Smithsonian.com. Smithsonian Magazine, December 2013. <http://www.smithsonianmag.com/science-nature/how-climate-change-is-helping-invasive-species-take-over-180947630/?no-ist>

²⁸ Dennings, Kelly. (2010). The Link between Recycling and Climate Change [SlideShares]. retrieved from <http://www.slideshare.net/NCDENR/the-link-between-recycling-climate-change>

these convenience centers, instead throwing their food scraps into the trash. Cities and towns that have implemented curbside composting have been able to move to bi-weekly trash pickup, freeing up funds for commercial hauling and processing of compost. Seattle, Portland, and San Francisco have curbside composting programs that could offer examples for Carrboro²⁹.

Ecosystem Recommendation #1: Pursue Stormwater Utility

Create a Stormwater Utility in Carrboro, or Join Chapel Hill's Stormwater Utility.

The Town has taken steps to exceed minimum State requirements for stormwater volume control and water quality buffers for new development and instituted land use planning and policies that have to some extent reduced surface water impacts from new development and exceeded what many other jurisdictions have pursued. The Town has also actively worked with the Bolin Creek Watershed Restoration Team to restore the aquatic health of Bolin Creek. Nevertheless, monitoring of aquatic life continues to identify concerns for the health of Bolin Creek, and stormwater runoff is also known to impact Morgan Creek and other creeks in Carrboro. From the viewpoint of residents with properties regularly experience flooding impacts, however, the Town has not yet been able to comprehensively respond to these impacts. The reality of climate change means that it will likely become more difficult in the future to adequately safeguard the health of local streams and citizens properties. In addition, the Town is faced with both current and new future regulatory requirements related to stormwater runoff. The Town administers an NPDES Phase II stormwater permit, and also will be pursuing a multimillion dollar initiative in the next decade to comply with the Jordan Lake Existing Development Rules.

According to the UNC Environmental Finance Center, there are currently 55 utilities operating in North Carolina, including many utilities in small towns. Chapel Hill has formed a stormwater utility that has significantly increased Chapel Hill's ability to more proactively manage stormwater. The Task Force believes that the typical/average stormwater utility fee of \$1/month/1000 sq. ft. of impervious surface for North Carolina stormwater utilities is one which a majority of Carrboro residents would be willing to pay if the revenue is well managed, especially if provisions are included so that the fee structure not be burdensome to lower income residents. There appears to be a solid foundation from the work of all these communities to have dedicated, predictable and sufficient funding for stormwater management efforts.

²⁹ Seattle composting program:

<http://www.seattle.gov/council/bagshaw/attachments/compost%20requirement%20QA.pdf>

Portland composting program: <http://www.portlandoregon.gov/bps/56513>

San Francisco composting program: <http://www.sfenvironment.org/zero-waste/recycling-and-composting>

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| Implementation Opportunities | <ul style="list-style-type: none"> • Fee structure can be set up for greater “environmental equity” (fees are based on actual runoff impact, not property value). • Emerging/innovative financing approaches exist for stormwater and green infrastructure. • Chapel Hill’s stormwater utility offers: local lessons (what works well/what is difficult); staff with technical expertise in engineering, science, administration, outreach/education; potential for efficiencies/sharing of resources. • A utility would help address current limited fiscal and staff capacity to meet needs for flooding issues/property impacts, protecting and restoring surface water quality, requirements for federal/state stormwater permit, and planning for compliance with Jordan Lake rules. • Opportunities exist for incorporating incentives for implementation of on-site stormwater management. For example, offering subsidies to help homeowners and businesses pay for part of a project on their land as a way to incentive the implementation of BMPs on private property. • The City of Durham has found that it is less expensive overall to distribute stormwater-related expenses as a utility fee rather than by increasing property taxes.⁴ |
| Implementation Challenges | <ul style="list-style-type: none"> • Carefully planning the utility’s goals upfront. • Determining whether to create a new utility, join Chapel Hill’s utility, or explore an alternative approach that protects the benefits of a utility. • Determining a pathway for helping low-income individuals (exemptions, reimbursements, etc.). • Creating a well-conceived and well-implemented public outreach campaign. This campaign is needed to get public buy-in, ensuring that citizens are understand the purpose of and need for the utility. |
| Resources Needed (human and material) | <ul style="list-style-type: none"> • Funds for stormwater management/financing study • Eventually, new staff position(s) • Partnering agreement if collaborating with Chapel Hill • Funds for an education campaign |
| Anticipated Cost | See footnote ³⁰ |
| Leadership | <ul style="list-style-type: none"> • Policy leadership from Board of Aldermen. • Management, technical, and administrative leadership from staff. • Environmental Advisory Board may be able to provide support. • Chapel Hill and Durham stormwater may be able to provide advice based on their own experiences. |
| Partners | Potentially Chapel Hill, OWASA |
| Fit with Items | Creating a new revenue stream for the Town adds capacity (Community Integration Recommendation #5) |
| Time Frame | Deciding to look into a stormwater utility could happen immediately. Forming a |

³⁰ The average residential fee across 55 utilities in NC is currently about \$1/month/1000 sq. ft. of impervious surface. Chapel Hill’s utility’s fee is about twice the average rate. See <http://www.efc.sog.unc.edu/reslib/item/nc-stormwater-utility-dashboard#> for details on NC stormwater utility rates.

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| | utility or joining Chapel Hill's utility would likely take 1-2 years |
| Next Step(s) | <ol style="list-style-type: none"> 1) Staff to look into both administrative and policy opportunities and challenges <ol style="list-style-type: none"> a) Contact nearby jurisdictions and Environmental Finance Center determine best fit for Carrboro in creating a utility. b) Determine whether or not to partner with Chapel Hill's stormwater utility. 2) Craft public outreach/education campaign about negative impacts of stormwater and economic/environmental benefits of a utility. |
| Evaluation Criteria | <ul style="list-style-type: none"> • Town can consider annual surveys and other means of measuring public awareness about stormwater impacts and management • Increased number of BMPs created and increased amount of area treated to control stormwater runoff* • Improved stream health as measured by aquatic insects • Changes in stream hydrology based on stream gage monitoring • Availability of harvested rainwater in times of drought • Utility is being funded by fees collected |

<http://www.efc.sog.unc.edu/project/innovative-financing-approaches-stormwater-and-green-infrastructure>

The Town has been including future mandatory stormwater projects in its CIP. However, the financing mechanism (e.g., property tax increase, debt financing, fee basis) for pursuing these projects is not clear.

*See #7 on the City of Durham's Stormwater Utility Fee Frequently Asked Questions Page: <http://durhamnc.gov/ich/op/pwd/GIS/Pages/FAQ.aspx>

Ecosystem Recommendation #2: Pursue Deer Herd Management

Pursue a Humane Deer Herd Management Program

Studies have shown that excess deer are adversely affecting the health of our forests by overgrazing, causing a decrease in plant diversity, and aiding in the spread of exotic species. The current deer herd population is probably on the order of 5-10 times the optimal size for overall ecosystem health. The least expensive and most effective method for deer herd management is through culling programs, often focusing on an urban archery program that can be tailored to a community and also provide food to people in need. Such programs have been safely and successfully implemented in Duke Forest, Chapel Hill, Durham, Raleigh, Pittsboro and many other towns in North Carolina. While culling can be seen as a safety issue, there have been no documented archery related accidents in NC for the past 40 years.

The NC Wildlife Resources Commission and others are available to advise the Town about the feasibility of creating a program that is tailored to the needs of Carrboro and addresses all concerns. The Task Force therefore recommends that Carrboro reopen the consideration of implementing its own deer herd management program to reduce negative impacts on forest regeneration and ecosystem health and biodiversity and protect our forests from an expanding deer population that is too large now and

may grow. Specifically, the Task Force recommends that the Town consider submitting a letter of intent to participate in the Urban Archery Season program of the NC Wildlife Resources Commission.

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| Implementation Opportunities | <ul style="list-style-type: none"> • A reduced/better managed deer population would: <ul style="list-style-type: none"> ○ Allow young trees and shrubs to grow, ensuring the continued existence of the forest and an increase in biodiversity; ○ Slow or stop the conversion of seed stores from native wildflowers and grasses to invasive species; ○ Improve the overall health of the deer population; ○ Decrease the incidence of deer/vehicle collisions ○ Provide food to people in need |
| Implementation Challenges | <ul style="list-style-type: none"> • Contraceptives are expensive (\$600-800/doe) and only work when the deer population is isolated and does not have an opportunity to migrate in or out of a given area. • Sterilization is expensive (\$800-1,000/doe) and is currently not legal in North Carolina. • Culling deer herds is an emotional issue, despite clear science that shows deer herd management results in a healthier deer population, produces a more intact forest ecosystem, and has a positive impact on other wildlife species. • Culling is also a safety issue in the eyes of law enforcement, even though there have been no documented archery-related accidents in NC for the past 40 years. • A well-conceived and well-implemented public outreach and education campaign will require Board and staff approval and effort. This campaign is needed to get public buy-in, ensuring that citizens understand the purpose of, and need for, managing the deer population. |
| Resources Needed (human and material) | <ul style="list-style-type: none"> • Administrative support from Town Staff with help from the Environmental Advisory Board. • Advice/guidance from other locales with an effective program already in-place (e.g., Chapel Hill, Durham, Raleigh, Pittsboro, and Duke Forest) and the NC Wildlife Resources Commission. • Promotional and educational materials. |
| Leadership | Policy leadership by the Board of Alderman. Administrative support from existing Town Staff and the Environmental Advisory Board. |
| Partners | Town of Chapel Hill, Carolina North Forest Management, NC Wildlife Federation, Duke Forest |
| Fit with Items | Tree Coalition, Invasive Plant Management |
| Time Frame | Urban archery season is in the fall. A decision could be made as to whether to look into for the fall of 2016 or 2017. |
| Next Step(s) | <ol style="list-style-type: none"> 1) Examine nearby urban archery plans. In particular, examine means for addressing public input, notification, and safety. 2) Write up a draft urban archery plan. 3) Craft public outreach and education campaign about negative impacts of deer overpopulation, benefits of deer herd management, and how an urban |

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| | <p>archery program would work.</p> <ol style="list-style-type: none"> 4) Board of Aldermen decide on public input process. 5) Submit letter of intent to participate in the Urban Archery Season to the NC Wildlife Resources Commission. 6) Finalize urban archery plan 7) Implement urban archery season. |
| Evaluation Criteria | <ul style="list-style-type: none"> • Number of deer culled and reduction of deer per square mile. • Improved health of deer population. • Reduction in number of deer-vehicle collisions. • Return of forest understory (increase in native flora, decrease in exotic species, and increase in plant and animal biodiversity). Reduced loss of crops, gardens, and planted ornamentals. |

Ecosystem Recommendation #3: Accelerate/Expand Organic Waste Collection/Composting

Accelerate Efforts to Study and Implement a Comprehensive Organics Collection and Composting Program.

The Solid Waste Advisory Group, along with local government staff, are actively looking at the future of solid waste in Orange County, including implementation of an organics program. The Task Force encourages the Town and county to prioritize and look into how to accelerate this effort. Detail ideas are provided below.

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| Implementation Opportunities | <ul style="list-style-type: none"> • Improved soil quality; • Improved water quality; • Decreased carbon footprint by decreasing methane gas and decreasing the number of trips to the transfer station. • Potential to move to bi-weekly trash pickup, freeing up funds for commercial hauling and processing of compost. Funding for the program could come entirely from the reduction of trash hauling and tipping fees. • A backyard composting demonstration site(s) in a central location(s) could encourage people to participate in composting. • The Town could consider offering finished compost for sale to the community (currently done at the county level) or providing it for free to program participants. |
| Implementation Challenges | <ul style="list-style-type: none"> • Educating the public is critical, as contamination of waste streams remains problematic. Contamination is a big problem in composting due to packaging, utensils, and other plastics being discarded with organic matter. Any campaign would need to be multilingual, as Carrboro is home to many people who speak Spanish or Karen as their first (and sometimes only) language. • Residential composting is especially challenging for multi-family housing, which is more prevalent in Carrboro than other jurisdictions in Orange |

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| | <p>County. Future planning needs to be sensitive to this challenge.</p> <ul style="list-style-type: none"> • It can be labor-intensive to get businesses on board. Orange County staff currently have to go back to a business two or three times to get the business to agree to participate. In addition, employees need to be retrained as new people are hired. • Questions remain about program financing. Will Pay-As-You-Throw be viable? Would residents be charged for composting services, or given a discount on trash/recycling services if they compost? Would they pay for the collection but then receive free compost in return? |
| Resources Needed (human and material) | <ul style="list-style-type: none"> • Potentially, further waste characterization studies • Composting equipment (bins, trucks). • A business to take the food waste if Carrboro isn't going to have its own composting site. • Utility or some way to process fees from participants. • Additional staff resources and/or partnerships with community groups and/or businesses to expand outreach and education. This could include encouragement of a local business to operate the curbside program (such as CompostNOW). |
| Anticipated Cost | The main cost is likely to be the educational campaign aimed at letting people know what can be composted and what still goes in the trash, along with bins. Once the program is running, it will fund itself through money that used to be spent hauling and disposing of trash in landfills. |
| Leadership | <p>Policy: Solid Waste Advisory Group.</p> <p>Technical: Local government staff.</p> |
| Partners | Local gardening organizations, environmental groups, local businesses, county staff. |
| Fit with Items | Community Integration recommendations |
| Time Frame | Current trajectory for Solid Waste Advisory Group (SWAG) is three to four years to study and begin implementing a residential composting program. It's recommended that SWAG prioritizes this and provide direction to staff as to opportunities for acceleration. |
| Next Step(s) | <ol style="list-style-type: none"> 1. SWAG provides direction to prioritize 2. Local government staff collaborate to hire a consultant to complete study 3. Study includes lessons learned from other communities with successful curbside composting (San Francisco, Portland, Seattle, NYC) and locally successful programs (CHCCS, UNC, etc.) as well as how to collaborate with local contractors (Brooks, CompostNow, etc.).³¹ 4. Budget for and choose area for pilot program that includes residential and multi-family units. 5. Expand program to entire town. <ul style="list-style-type: none"> • Future plans should consider adding a more central drop-off location downtown. |

³¹

<http://dusp.mit.edu/sites/dusp.mit.edu/files/attachments/project/Municipal%20Curbside%20Compostables%20Collection%20What%20Works%20and%20Why.pdf>

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| | <ul style="list-style-type: none"> • Future studies and plans should include curbside compost collection. |
| Evaluation Criteria | Set a goal of 30% reduction in organic material being hauled to the transfer station by 2020, then 70% by 2030. |

Ecosystem Recommendation #4: Create a Tree Coalition

Help Community Members Form an Independent Tree Coalition to Support the Community and Advocate for the Community Forest

Most of Carrboro's community forest is owned and managed by private landowners. There is a rich community of local arborists, gardeners, landscapers, nurseries, botanists, and ecologists that can support the community in creating healthier and more beautiful yards and ultimately a more resilient and diverse community forest. However, the knowledge and skills are relatively dispersed. Landowners can benefit from a local resource to help with forest, landscape, and tree management and advocacy.

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| Implementation Opportunities | <ul style="list-style-type: none"> • Increase public awareness of the intrinsic value and beauty of trees. • Provide oversight for a community scale urban forestry program. • Educate citizens about proper tree selection, planting, and care. • Educate citizens about the health of the larger community forest, its importance for both human and environmental health, and ways in which they can support it. • Partner with local government and civic groups to improve and expand the Town's tree canopy. |
| Implementation Challenges | <ul style="list-style-type: none"> • Creating a new and sustainable organization or finding an existing organization to lead the coalition. • Connecting with the public. |
| Resources Needed (human and material) | <ul style="list-style-type: none"> • A nonprofit organization to become a community champion for education, outreach, and action. • Neighborhood and business champions. • Broad support from community leaders, utilities, and business partners to help fund and provide technical expertise (e.g., arborists, foresters, nurseries, landscapers, NC Botanical Gardens, NC Cooperative Extension Service, Carolina North staff, Duke Forest staff). • Fiscal/policy/staff support from Town, North Carolina Urban Forest Council. |
| Anticipated Cost | Costs associated with nonprofit establishment/management if an existing nonprofit doesn't offer to take on the task (though this may be unnecessary if a coalition, like the Carrboro Bike Coalition, is formed.) |
| Leadership | Nonprofit/community members pulled together by Town staff. |
| Partners | NC Botanical Garden, Arbor Day Foundation, National Wildlife Federation, possibly expanding to Chapel Hill, Hillsborough, and/or Orange County. |
| Fit with Items | Deer herd management; stormwater utility; invasive plant management |
| Time Frame | Depends on identifying leadership and ability to mobilize community |
| Next Step(s) | Establish goals for the coalition |

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| | Recruit members Form partnerships with those who have technical expertise. Begin education/outreach campaign to community |
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Ecosystem Recommendation #5: Improve Regulations and Community Capacity to Discourage Invasive Plants and Encourage Native Plants

Pursue both Regulatory and Non-regulatory Approaches to Minimize Risk of Better Manage Invasive Plant Species and Increase Community Efforts to Improve Plant Communities

There is a trend in local plant communities in which non-native and invasive plants are spreading and native plants are declining. Ideas for approaches to reverse this trend are offered in this recommendation.

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| Implementation Opportunities | <ul style="list-style-type: none"> • Implement a campaign to educate people on the link between native plant species and ecosystem health, particularly for pollinators who face stress due to climate change and other factors. • Encourage naturalized landscaping instead of manicured lawns. These types of landscapes offer critical wildlife habitat, cause a decline in the use of petroleum-based fertilizers and pesticides, more effectively capture stormwater runoff, and reduce the heat island effect.³² • Pursue invasive species removal projects, especially in Town parks and along greenways/bikeways/right-of-ways. Such projects would be carried out by citizens but perhaps spearheaded by a local non-profit or task force. Projects could initially focus on: <ol style="list-style-type: none"> 1. Vining invasives (Japanese wisteria, porcelain berry, kudzu, mile-a-minute, English ivy, Japanese honeysuckle, oriental bittersweet, Japanese euonymus) that threaten urban tree health; 2. Japanese stiltgrass and privet that alter soil pH and outcompete many native grasses and shrubs. |
| Implementation Challenges | <ul style="list-style-type: none"> • Many people don't know what a native plant is, nor do they know that the plants they're choosing for their yard are invasive. • Many people don't understand the link between native plants and ecosystem health, choosing their plants based on cost or aesthetics. • Renters don't often have the option to choose what's planted outside their door. • Some landowners and HOAs are resistant to native species or more natural- |

³² See this book for more information on the benefits and approaches for more naturalized yards and landscapes: Tallamy, Doug. *Bringing Nature Home*. Portland: Timberpress, 2010. Print.

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| | <p>looking landscapes.</p> <ul style="list-style-type: none"> • Some developers may need outreach and education. • Large/big box nurseries often sell few (if any) native species • Some people need assistance learning about/accessing local nurseries that specialize in natives. • Deer tend to ignore non-native species and prefer native species. |
| Resources Needed (human and material) | <ul style="list-style-type: none"> • Town staff to examine/amend ordinances. • Someone(s) to head an educational campaign. • Someone(s) to lead invasive species removal projects. |
| Anticipated Cost | Money for an educational campaign and supplies for projects removing invasives (tools, leaf bags, etc.). |
| Leadership | Town staff, Environmental Advisory Board, a non-profit or task force to lead invasive removal projects |
| Partners | NC Botanical Garden, NC Native Plant Society, local nurseries, biologists, local bee keepers, landscapers knowledgeable about native/invasive species, HOAs, Friends of Bolin Creek, Morgan Valley Alliance |
| Fit with Items | Deer Herd Management; Tree Coalition |
| Time Frame | Town staff are currently looking at the LUO. An outreach campaign is a long term undertaking. |
| Next Step(s) | <ul style="list-style-type: none"> • Update the Land Use Ordinance invasive/native plant requirements. • Implement an educational campaign, maybe in partnership with the Botanical Gardens or others, to help citizens and businesses understand the importance of planting natives and avoiding invasives. This could be done in conjunction with the Town's newly established annual Pollinator Day. • Explore options for implementing invasive removal projects. • Develop and regularly update an inventory of areas with excessive invasive plant growth |
| Evaluation Criteria | <ul style="list-style-type: none"> • Stronger ordinance against invasive species and in favor of native species. • Decrease in the number of invasive species in Carrboro and an increase in the number of natives. • More knowledgeable citizenry concerning the importance of native species. |

Implementation Recommendations

Carrboro established a temporary Energy and Climate Task Force in 2014, charged with providing recommendations on reducing nonrenewable energy use from residential and commercial buildings and transportation, increasing renewable energy generation, , and supporting healthier and more resilient ecosystems in Carrboro. Recognizing that the recommendations provided will require dedicated, ongoing community involvement and Town support, the Task Force further recommends that in order to maintain momentum, the Board of Aldermen should move expeditiously to establish a permanent Task Force to oversee implementation of the Community Climate Action Plan. This Task Force should draw from the expertise that can be found across the community in clean energy and clean transportation, funding and financing mechanisms, ecosystem enhancement, and in developing and working with coalitions across the community. It is further recommended that this permanent Task Force should have appointees from advisory boards such as the Planning Board, Environmental Advisory Board, Transportation Advisory Board, and Economic and Sustainability Commission. To support the establishment of a permanent Task Force, a draft of a “charge” for the Task Force is proposed below:

- a. Coordinate overall implementation of the recommendations of the Community Climate Action Plan;
- b. Work with community groups, nonprofits, and members of the Carrboro business community, homeowners associations, and neighborhood groups to implement all recommendations;
- c. Work with the Transportation Advisory Board to implement transportation recommendations; and
- d. Work with the Environmental Advisory Board to implement the ecological recommendations.
- e. Provide recommendations to the Town for support needed from the Town to implement the Community Climate Action Plan.

This plan identifies a number of recommendations that include elements of implementation, however it is beyond the scope of the plan to include a detailed implementation plan. The following suggestions are offered as a starting point for pursuing implementation, and focus on categorizing the recommendations into (somewhat arbitrary) timeframes for consideration. “Work has already begun: emphasis needed” refers to recommendations which are currently being pursued, and the predominant need is for acceleration, mobilization, and/or additional resources. “Begin immediately” refers to recommendations that the Task Force asks the Town to consider immediately and prioritizes because the Task Force recognizes their importance, they support other recommendations, can potentially be pursued by the Town with more limited partnering requirements, outside or new resources or statutory authority, and in general have a low risk/high reward. Those listed “Within one year” are likely to involve more effort, rely more heavily on the creation of partnerships, the development of educational campaigns, and/or input from the community. Items listed under “Within two years” will likely require significant effort and reliance on potential partners and are subject to some uncertainties. Finally, a regulatory based approach to two recommendations is likely to be possible only through changes in state law. While this prioritization is offered to attempt to make the entire pallet of recommendations more manageable from an implementation perspective, considerable flexibility is needed, and reasons to adjust the

priorities will no doubt arise as part of implementation. Additional suggestions on the time frame and next steps are included in the more detailed recommendations in previous sections of the plan.

Work has already begun: emphasis needed:

Transportation Recommendation #2: Improve Bicycle and Pedestrian Infrastructure

Transportation Recommendation #4: Improve Vanpool/Carpool Options

Transportation Recommendation #5: Further Promote Walking, Biking, Transit

Ecosystem Recommendation #3: Accelerate/Expand Organic Waste Collection/Composting

Ecosystem Recommendation #5: Improve Regulations and Community Capacity to Discourage Invasive Plants and Encourage Native Plants

Begin immediately:

Community Integration Recommendation #4: Integrate Climate Action with Local Living Economy

Buildings Recommendation #1: 50% Challenge

Transportation Recommendation #1: 50% Challenge

Ecosystem Recommendation #1: Pursue Stormwater Utility

Begin Within 1 Year:

Community Integration Recommendation #1: Create Grass Roots Partnerships to Engage Community

Community Integration Recommendation #2: Expand Public Partnerships to More Explicitly Consider Climate Action

Community Integration Recommendation #3: Create Green Neighborhood Program

Community Integration Recommendation #5: Expand Capacity

Community Integration Recommendation #6: Facilitate Low Cost Financing for Energy Efficiency and Renewable Energy Projects

Community Integration Recommendation #7: Integrate Climate Action and Social/Equity Initiatives

Buildings Recommendation #4 and Renewable Energy Recommendation #3: Create Rental Property Task Force and Process

Buildings Recommendation #5: Create Rental Property Registry/Certification

Transportation Recommendation #6: Limit Idling in School Loading Zones

Renewable Energy Recommendation #1: Pursue Community Solar Projects

Ecosystem Recommendation #2: Pursue Deer Herd Management

Ecosystem Recommendation #4: Create a Tree Coalition

Begin Within 2 years:

Transportation Recommendation #3: Enhance Transit Service

Renewable Energy Recommendation #2: Create a Downtown Geothermal District

Statutory Authority May Be Needed to Pursue Recommendation:

Buildings Recommendation #2: Require Energy Audit/Performance Rating

Buildings Recommendation #3: Demonstrate/Pursue Energy Performance Beyond Minimum Requirements for New Development

(For these two recommendations, a non-regulatory approach is also offered in the recommendation for which statutory authority is not needed.)

Appendix 1

Boulder's Local Climate Action Plan and Climate Commitment

The Task Force recommends that Carrboro pay close attention to Boulder, Colorado, a community that is leading the pack with local climate action planning in the US³³. For example, Boulder is:

- 1) A leader in energy efficiency according to the American Council for an Energy Efficient Economy. Boulder has distinguished itself through:
 - a. excelling in improving access to energy usage information;
 - b. implementing the SmartRegs program, which mandates baseline energy efficiency requirements for rental housing;
 - c. receiving the highest rating from ACEEE by having staff dedicated to implementing community-wide efficiency goals and implementing programs to mitigate the urban heat island effect, including instituting an Urban Forestry program.
 - d. Piloting Community Power Partnership, a program designed to help residents and businesses better understand their electricity use at a whole-building and circuit levels.
 - e. Piloting Boulder Energy Challenge, a grant program launched in 2014 that has provided \$300,000 funding for innovative solutions from the community to reduce emissions.
 - f. Running EnergySmart, a program that offers energy efficiency assessments, advising services and rebates for residents and businesses. Since EnergySmart began in 2010, more than 7,500 housing units and 2,300 businesses have participated in the program, more than \$3.4 million in rebates have been paid and over \$18 million in private investments made.
- 2) Working to become a zero waste community that reuses, recycles and composts at least 85 percent of its waste stream by the year 2025.
- 3) Becoming a Platinum Bicycle Friendly Community (one of 4 in the US).
- 4) Pursuing owning and operating a local electric utility, a process known as municipalization. For the city, it's an opportunity to move away from getting electricity from a for-profit investor-owned utility with a carbon-intensive coal-powered energy supply.
- 5) Becoming a platinum-level Solar Friendly Community in 2014, with one of the highest per-capita solar installations in the country. Since 2007, Boulder residents, businesses and institutions have installed more than 15 megawatts of solar on more than 1,900 rooftops.
- 6) Supporting climate action initiatives by the Climate Action Plan (CAP) tax (since 2007). The tax funds city-funded programs and services designed to reduce local greenhouse gas emissions.
- 7) Pursuing a GHG reduction goal of 80% by 2050, having already made substantial progress.

³³ More information about what Boulder is doing is available at <https://bouldercolorado.gov/climate> and <https://bouldercolorado.gov/climate/boulders-climate-commitment>.

Appendix 2

How the Jones Household Goes Carbon Free in 10 Years

In July 2008, Al Gore challenged the country to generate all our electricity carbon free in just 10 years. He believes it's possible, and so do we. We also think it's possible for individual families to go carbon free in 10 years.

How the Jones Household Goes Carbon Free in 10 Years

HERE'S HOW YOU CAN DO IT ...



yes!
magazine

Reprinted from
Issue 45
Spring 2008

CLIMATE
SOLUTIONS

yes!
magazine

Related articles at
[www.yesmagazine.org/
climatesolutions](http://www.yesmagazine.org/climatesolutions)

Beyond Lightbulbs

The Jones Household Goes Carbon Free in 10 Years



START
HERE

YEAR 1

A Big Difference from Small Changes

The family starts off with easy changes: They wash clothes in cold water and air dry them in the summer, replace incandescent bulbs with compact fluorescents (CFLs), turn off their computer when not in use. That's an instant, virtually free savings of 6,200 pounds of CO₂. They make one simple transportation change: One of the adults commutes by bus three days a week—enough to see whether it can be done, but keeping the second car just in case. That's worth another 2,200 pounds. They're down to 51,600 pounds and it hasn't cost them anything but the price of the CFLs and a clothesline. They're actually saving money.



YEAR 2

Home Improvement

They stop donating so much heat to the outdoors: attic and basement insulation, sealing and insulating heat ducts, and patching the large air leaks typical of standard construction saves them a whopping 7,100 pounds. These savings aren't free up front, but the savings in heating and cooling bills will repay the cost over time. Besides, Mrs. Jones is handy with home repair, and does a lot of this work herself. Down to 44,500 per year.



YEAR 3

House and Car

The bus commute's gone well, so Mr. Jones now buses to work all the time. They've worked on consolidating trips outside work, and find they can do without the second car altogether. That's 5,900 pounds gone. They finish weatherproofing their house: beefing up wall insulation, weatherizing doors and windows, and upgrading to high performance windows. Another 1,800 pounds disappear. They're at 36,800.



YEAR 4

Shed Carbon on Vacation

Instead of flying for their annual vacation, the Joneses take the train: a leisurely way to save 7,200 pounds every year. (If they took the bus, they'd save even more.) They're at 29,600 pounds per year—halfway there a year early.



YEAR 5

Car Upgrade

Time to replace the car. Thanks to consumer demand, electric cars have become widely available, and they buy one. Even charging on dirty power, they save 9,000 pounds. Household total is now 20,600.



Brooke Jarvis and Doug Pibel

Meet the Joneses. They're your average U.S. energy consumers. They haven't yet upgraded to energy-efficient appliances, their house needs better insulation, and they keep the place as cool in the summer and warm in the winter as most Americans do. The two adults commute 30 miles each per day, in separate cars with average fuel efficiency, and every year they each drive an additional 4,500 miles running errands and taking their child to soccer games and violin practice. The family takes one vacation trip per year, flying to visit grandparents 1,350 miles away. How much CO₂ do their house and cars produce? We figure it at 60,000 pounds, or 10 tons for each family member.

Lately, though, the Joneses have been reading about climate change, and they're getting worried. Ecological crisis has never felt so urgent before. Even little Joey Jones is talking greenhouse gases—he learned at school that scientists are predicting a worldwide climate catastrophe that will change the rest of his life, unless we stop the worst effects by making big changes in the next ten years. The Joneses decide: change is necessary, and they're ready to do their part. But how much can they really do? A lot, it turns out.

In 10 years, without sacrificing their way of life, the Jones family eliminates the CO₂ emissions that their home and transportation used to create—the bulk of their carbon footprint.

Count Your Carbon

Want to keep up with the Joneses? Here are the numbers we used. Use them to find—then shrink—your own carbon footprint.

| | CO ₂ output, in pounds |
|--|--------------------------------------|
| Gallon of gas | 19.36 |
| Gallon of fuel oil or diesel | 22.38 |
| Kilowatt hour of electricity (national average) | 1.43 |
| Therm of natural gas | 11.71 |
| Gallon of propane | 12.67 |
| Per passenger: | |
| Airplane mile | 1.28 |
| Train mile | 0.42 |
| Long-distance bus mile | 0.18 |
| Local mass transit mile | 0.50 |
| Electric bike mile | 0.02 |

The Rest of the Story

The Joneses only changed their housing and transport habits. How can you go further?

Eat meatless. For every day of the week you skip meat, you'll save 215 lbs. per year.

Buy local. Most food eaten in the U.S. has traveled 1,500 miles to your plate.

Be a low-impact consumer. Choose local products, reduce the stuff you buy, and save embedded energy by buying used.

Reduce waste. Stop junk mail, reduce packaging, and reduce the 2,020 lbs. each American's waste produces annually.

Avoid the McMansion. A smaller house saves a lot of carbon: on average, 11.4 lbs. of CO₂ per square foot per year.



YEAR 6

Hot and Cold

They improve their water system, including insulating their hot water heater and their pipes, and also lower the temperature of their water heater: 1,000 pounds down. When the old refrigerator kicks the bucket, the Joneses buy a new energy-efficient one and finally unplug a second fridge in the garage, knocking off another 1,300. Total remaining: 18,300.



YEAR 7

Close to Home

Grandma and Grandpa retire and move nearby. The Joneses now vacation within the range of their electric car, saving 3,300 pounds of CO₂ each year. The city converts its bus fleet to clean electricity, which saves another 1,200 pounds. They're down to 13,800.



YEAR 8

A Few More Things Around the House

An efficient clothes washer saves carbon on its own, and saves dryer time. With all the money they're saving, they decide it's time to invest in a solar hot water system. Total: 2,000. Leaving 11,800.



YEAR 9

Electric Bikes

While the Joneses have been on this journey, their town has responded to citizen pressure and gone bike friendly. The new bike paths make it easy for both to ride to work. To ease the hills, they buy electric bikes. There are four months of the year when they can't bike, so they continue their usual commute patterns then. Savings: 3,500. Total remaining: 8,300.



YEAR 10

Green Power

The Joneses' furnace has been groaning and working overtime. They replace it with an electric heat pump, which also cools the house in summer. They also buy certified green, renewable power from their electric company, and the switch from coal plants eliminates the remaining 8,300 pounds of CO₂ produced by the electricity for their house and car.



Sources: Rocky Mountain Institute, Bureau of Transportation Statistics, Environmental Protection Agency, Department of Energy, University of Chicago. Illustration by Kayann Legg / I-S

Appendix 3

10 Things You Want to Know about Human Nature if You're Fighting Climate Change

By [Lisa Bennett](#), posted at <http://grist.org/climate-energy/10-things-you-want-to-know-about-human-nature-if-youre-fighting-climate-change/> June 10, 2015.

I've spent nearly a decade thinking about why people get stuck on climate change: stuck in debates, denial, what looks like indifference, and the awful discomfort that comes with the question "But what can I do?" In search of answers, I've interviewed dozens of experts in psychology, neuroscience, sociology, economics, political science, and other fields — and many more Americans across a broad spectrum of political affiliations, income brackets, and ages. I've also read widely to tap the thinking of those who were once more commonly looked to for insights into human nature, such as poets, philosophers, and spiritual leaders. What I've come up with is my own climate-centric version of Robert Fulghum's *All I Really Need to Know I Learned in Kindergarten*. Climate change has been my window into learning about human nature — or, at least, about what we humans do when faced with a challenge much greater than ourselves. The experience has also persuaded me that a better understanding of our own nature can help inspire a more effective response to what is happening to the natural world.

Here then are 10 things I've learned, along with some ideas about how these insights might be applied by those working on climate change:

1. We are overly optimistic about the future — *our* future, that is. Neuroscientist Tali Sharot has observed that when newlyweds are asked about their chances of getting divorced, they tend to say zero, despite the widely known fact that the odds are 50-50. We instinctively overestimate the probability of positive events and underestimate the probability of negative events in our own lives, she writes in *The Optimism Bias*, for two reasons: We think we have more control over our lives than we actually do, and we tend to see ourselves as better than average.

Applied to climate change, this means that I might think that you — and surely those poor Pacific Islanders — might be negatively affected but I'll be OK. The problem, of course, is that this reflects a bias grounded in delusion. But don't try to tell me or anyone else that. You'll have a better chance of engaging others in climate action, experts like Sharot say, if you keep a laser-like focus on how climate change is affecting people now.

2. We can be blasé about the most important issues in the world because the global perspective is way beyond ordinary human scale. "Trying to convince people of the magnitude of the climate problem through large-scale statistics is essentially useless," says Scott Huettel, chair of the Department of Psychology and Neuroscience at Duke University. "The iconic global warming image of the polar bear on the iceberg is evocative precisely because it is one polar bear. Thousands of polar bears on a glacier that is receding would be irrelevant. Our brains cannot process it."

Put another way, climate change seems like an abstraction because it is so much bigger than us. Humans relate to human-sized stories — the kind that speak to a family living in a home like ours, having dreams and struggles like ours, and maybe discovering one day that their home is on a map of places expected to soon be under water.

3. We are wired to refute imperatives. “If you say I have to act now on climate change, my first reaction will be, ‘No, I don’t,’” says Huettel. The reason, he explains, is that our brains are very well designed to come up with counterarguments. So no matter how good the reasons to switch to solar energy or demand that government take bolder action on climate change, people can always come up with reasons why they don’t need to do anything, such as: “If I don’t act right now, the world will basically be the same.”

Passing a law that requires people to change their behavior (especially if those changes are relatively easy to make) is one effective way around this. But short of that — just as in other aspects of human relationships — efforts to attract people to a cause are much more likely to yield a positive response than those that threaten or make demands.

4. We are vulnerable to peer pressure, especially about things that confuse us. We can watch the news, see photos of melting glaciers, even experience changing weather patterns. But if our neighbors aren’t doing anything about climate change, we’re unlikely to do anything either because, as much as we hate to admit it, we are herd animals who use social cues to adapt to our environment, according to [Robert Cialdini](#), author of *Influence: The Psychology of Persuasion*. And if you doubt how powerful this instinct is, consider the experiment Cialdini conducted in which his team hung four different kinds of flyers on people’s doorknobs in San Diego, with the goal of inspiring residents to reduce their energy consumption. Three of the flyers directly asked them to reduce their energy use, offering three different motivations: save money, save the environment, and benefit future generations. But none of these appeals made a significant difference. Only the fourth flyer did, which read simply: “The majority of your neighbors are undertaking energy-saving actions every day.” The lesson: Don’t be afraid to appeal to our instinct to fit in.

5. We shy away from topics that remind us of our mortality but can be motivated to take action on behalf of beings more vulnerable than us. Janis L. Dickinson, a professor of natural resources at Cornell University, conducted an experiment a few years ago in which she asked 3,546 people (largely birders) if they would be willing to reduce their energy consumption after learning that climate change was, among other things, a threat to people or to birds, and then she compared the results. It turned out that people were left unmoved by considering the threat to humans, but envisioning the threat to birds was another story. One possible reason, Dickinson says, is that considering climate change as a threat to humans may trigger thoughts of death (which we also tend to deny) whereas we like to think of ourselves as helping cute little creatures that seem to need us. This suggests that emphasizing the threat climate change poses to beloved animals could be an effective way of motivating people.

6. We perceive and respond to risks only when we feel them. While riding a roller coaster with my children one day, my youngest son took his hands off the bar and raised them in the air. The amusement park, I was sure, anticipated antics like this and did not expect people to remain in their seats by the strength of their grip. Still, I screamed, insisting he hold on because I was scared and, for the moment,

that made the risk I imagined feel real. This, says Columbia University professor of psychology Elke Weber, is how we perceive and respond to risk: through our emotions more than an analysis of the facts.

When it comes to climate change, this means that no matter how much scientific and journalistic evidence we are presented with, we will not be moved to action unless something makes us feel the risk. As a result, it may be more effective to tell a short, detailed story that can evoke people's feelings — for example, about an individual or family encountering some specific impact of climate change — than present yet more scientific evidence about the global or even national implications of a warming planet.

7. We are motivated more by hope than fear, at least in matters of social change. While research shows that fear is a more powerful motivator than hope when it comes to behaviors such as diet and fitness, inspiring social change seems to depend more on a positive vision of the future, according to the social movement, political science, and neuroscience experts with whom I spoke. “This rhetoric about we only have a certain amount of time is a killer. It doesn't make people engaged, it makes them give up,” says David Meyer, professor of sociology at U.C. Irvine and author of *The Politics of Protest: Social Movements in America*. Sharot confirmed this, saying: “Our studies show that people don't process information — they don't pay attention — when what is being communicated is how things will get worse.” In a widely shared opinion, Meyer said the implication was clear: “You have to be hopeful.”

8. We are more likely to take action when we know precisely what we can influence. It would take a fantastic and deluded leap of the imagination to think that, as individuals, we can control rising seas, melting glaciers, or heat waves. As a result, when people hear messages that encourage them to broadly act on climate, it can strike them as unrealistic and trigger what psychologist Martin Seligman called learned helplessness — specifically because it appears so far outside their sphere of influence. But, as Seligman and others have also found, it is possible to cut through learned helplessness (or apparent indifference) by appealing to what people think they can control, such as their own attitudes and behavior. For this reason, Huettel recommends emphasizing how people will feel about themselves, for example, after they take some realistic action, such as riding a bike or buying a hybrid.

9. We need to believe our actions will make a difference. “We have to have some sense of efficacy to motivate us to make changes in our lifestyle that are beneficial to the planet,” says Paul Slovic, a professor of psychology at the University of Oregon and expert in decision making around risk. But when it comes to big issues like genocide or climate change, his research suggests that people can be demotivated by a sense of inefficacy as well as what he calls “pseudo-inefficacy” or the illusion of inefficacy. For example, Slovic explained, some people fail to do anything because they think their action will be just a drop in the bucket, even though that drop is important. This finding suggests that it could be useful to explicitly speak to people's suspicion that individual actions don't matter and creatively show them how such drops add up.

10. We will continue to behave the same way we always have — even after we know it is problematic — until there is a realistic alternative. It is a safe bet that if you are reading this, you know that fossil fuels contribute to climate change and yet you continue, either directly or indirectly, to rely upon them, as most of us do.

But the reason for this, I have firmly come to believe, is not because most people don't care, don't get it, or have been duped by climate denial propaganda. I find a more believable reason in the words of Thomas Kuhn, widely considered one of the most influential philosophers of science of the 20th century. "People are unlikely to jettison an unworkable paradigm, despite many indications it is not functioning properly," Kuhn said, "until a better paradigm can be presented." While individual behavior changes are essential, in other words, many of them remain dependent on systemic public- and private-sector changes. To fully succeed, we need a "moon shot"-style rapid transition to a clean energy economy, like the one [proposed](#) by a group of scientists and economists led by the U.K.'s former chief scientist, Sir David King.

But in the end, even the best of plans depends on understanding, communicating, and acting with a fuller appreciation not just of the state of the natural world but of our own nature, which means bringing today's global climate story down to a human scale. The good news is that doing so requires that we engage some of the best aspects of human nature, including our ability to be present in the here and now, to care more about people than facts, to be drawn to hope more than fear, to be willing to defend those weaker than us, and to focus our actions on things that are in our control — all the while being capable of believing in, even being thrilled by, the vision of a moon shot.

[Lisa Bennett](#), coauthor of [Ecoliterate](#), is a writer and communications strategist focused on climate change and what helps people rise to challenges great and small. She blogs at lisabennett.org/blog, and is on Twitter at [@LisaPBennett](https://twitter.com/LisaPBennett).

Appendix 4

Energy in the 21st Century: Excerpts from Post Carbon Institute's Energy Primer³⁴

We are now facing a transformational moment in our energy story. As we leave the age of seemingly cheap and plentiful fossil fuels and enter an era of extreme energy, the ever-rising financial, social, and environmental costs of fossil fuels can no longer be ignored. The essential problem is not just that we are tapping the wrong energy sources (though we are), or that we are wasteful and inefficient (though we are), but that we are overpowered, and we are overpowering nature.

– Richard Heinberg, from the Introduction to ENERGY: Overdevelopment and the Delusion of Endless Growth

The Energy Picture

In order to make the right choices and investments, we must have a more comprehensive understanding of our energy predicament, including:

- The true costs, potential benefits, and limitations of all energy options, including renewables;
- The impact of each form of energy production on human societies and nature; and
- The true relationship between energy, our economic system, and the environment.

It's tempting to take the micro-view and look for ways to target each of our energy problems with a technical fix. Can't we improve the energy efficiency of vehicles, insulate our buildings, and develop renewable energy sources? Yes, of course. Can't we regulate the fossil fuel industry better, and allow the vast, recently unlocked North American reserves of shale gas and shale oil to be produced responsibly? Possibly. We could do all of those things, and many more besides, to lessen the current energy economy's impacts on natural and human communities—and still there would remain serious obstacles ahead. Why? Let's move out from the details of our dilemma and take in the big picture.

What is Energy?

Though we cannot hold a jar of pure energy in our hands or describe its shape or color, it is nevertheless the basis of everything. Without energy, nothing could happen; matter itself could not exist in any meaningful sense. But because energy as such is so elusive, physicists and engineers define it not in terms of what it is, but what it does—as “the ability to do work,” or “the capacity to move or change matter.”

³⁴ <http://energy-reality.org/primer/>

In traditional societies, most useful energy came from the sunlight annually captured by food crops and forests; people exerted energy through muscle power and obtained heat from firewood. Modern industrial societies obtain enormously greater amounts of energy from fossil fuels, nuclear power, and hydroelectric dams, and they exert energy through a vast array of machinery. Industrial energy production is essential to every aspect of modern life, but no matter how far our technology for capturing or using energy advances, energy itself always remains the same.

In the nineteenth century, physicists formulated two fundamental laws of energy that appear to be true for all times and places. These are known as the First and Second Laws of Thermodynamics. The First Law is known as the law of conservation. It states that energy cannot be created or destroyed, only transformed. Think of energy as a singular reality that manifests itself in various forms—nuclear, mechanical, chemical, thermal, electromagnetic, and gravitational—and that can be converted from one form to another.

The Second Law states that in every energy conversion, some energy is dissipated (typically as heat). When the gas gauge in a car moves from “full” to “empty,” it may appear that the energy that is chemically stored in gasoline is being consumed. But all the energy that was originally present in the gasoline still exists. In reality, the stored energy is merely being released and doing some work as it moves from a condition of higher concentration to one of lower concentration. It is converted from chemical storage (via the atomic electromagnetic bonds within hydrocarbon molecules) to mechanical motion and heat (as combustion within the engine’s cylinders pushes the car forward and also increases the rate of motion of molecules in the cylinder and the surrounding environment).

We might be able to get some work out of the “wasted” heat being given off by the burning of gasoline in the car engine; but heat tends to radiate quickly into the general environment, so we would have to use that heat both immediately and close to the engine. If we could gather up all the heat and mechanical energy that was released by burning the tankful of gasoline, it could do just as much work for us yet again; but the act of re-concentrating and storing it would require more energy than we could regather. Thus, in effect, available energy is always being lost.

The Second Law is known as the law of entropy (entropy is a measure of the amount of energy no longer practically capable of conversion into work). The Second Law tells us that the entropy within an isolated system inevitably increases over time. Energy that is sufficiently concentrated (relative to background energy levels) so that it can do work for us is called a source. There are two kinds of energy sources: flows (examples include sunlight, winds, and rivers) and stocks (a word that in this context refers to energy chemically stored in substances such as wood or fossil fuels). Flows tend to be variable, whereas stocks deplete.

Energy-fueled Population Growth

Humanity’s current population explosion is an aberration. During the vast majority of human history, population levels were low and quite stable. Demographer Joel Cohen estimates that from the time our species emerged until roughly twelve thousand years ago, when local agriculture appeared, the

population growth rate was less than 1/500th of 1 percent. After the widespread adoption of farming the growth rate ticked up by a factor of ten or more, but for thousands of years thereafter remained at around 1/50th of 1 percent. It took all of human history until the early eighteen hundreds for global population to reach one billion. Then the population doubled—a second billion was added—in just a century or so. Adding the next billion humans to the planet took only thirty years. The next billion, fourteen years. The next, twelve years. After another dozen years, in 1999, world population reached six billion, and the seven billion mark was passed in 2011.

When charted graphically, the human demographic explosion takes the familiar “hockey stick” shape of a classic exponential growth curve. Many factors contributed to demographic expansion, including: the global agricultural revolution in the sixteen hundreds when new foods were shared between continents; the dispersal of scientific and public health knowledge; and increasing urbanization. But central to the runaway population growth of the past two centuries is the incredible windfall of energy that fossil fuels presented to humanity. The ability to command energy, especially highly energy-dense fuels like coal, precipitated the Industrial Revolution and allowed its descendant, the techno-industrial growth culture, to flourish. Food could now be produced in far larger quantities, and local scarcity could be overcome through global transport networks.

Leading ecologists agree that humanity has already surpassed Earth’s ecological carrying capacity. Exploiting the onetime reserve of fossil energy has allowed us to temporarily escape the constraints that kept early human population levels in check. Today’s global extinction crisis, massive poverty and malnutrition, rising social inequity, and unraveling ecosystems around the globe suggest that the age of abundance is nearly over. As economist Lisi Krall tells her students, “The defining fact of this historical moment is the reality of exponential growth. With exponential growth, if you do the same things as your parents, you’ll get entirely different results.” Confronting the population problem is the preeminent challenge of our time.

Net Energy

A business may have high gross receipts and still go broke; it is the net, the profit after costs are subtracted, that determines viability. For any potential energy resource, the fundamentals are the same. How much energy is available after subtracting the energy costs to extract, process, and deliver the resource? To know how much energy from a particular source can actually be deployed by society, we must factor in both the production costs and the system costs—that is, the energy required to make energy available to the end user. With gasoline, for instance, this calculation would include energy costs related to oil exploration, drilling, refining, transportation, and the infrastructure that supports each step of the process. With coal-derived electricity, the calculation would include the life cycle from mine to power plant to electric grid.

Experts who study this use the terms “net energy ratio” or “energy returned on energy invested” (EROEI). Decades ago when the most accessible reserves were drilled, an oil company might produce 100 barrels of oil or more for each barrel’s worth of energy invested. Declining oil field productivity has

brought the average net energy ratio for conventional oil down to approximately 20:1 globally, with more remote or hard-to-refine oil significantly worse. For fossil energy generally, the trend is downward despite technological advances in exploration and drilling. For biofuels, the net energy ratio is lower still. Some studies suggest that corn-derived ethanol actually has a negative net energy ratio—that is, more energy than a gallon of ethanol can deliver is used to produce a gallon of ethanol. Sugarcane-based ethanol has a superior net energy ratio, but it is still low compared to fossil fuels.

Any produced energy resource can be analyzed for its net energy ratio, although the process raises a difficult question: What are the boundaries of consideration? For example, when tallying the energy required to build a solar photovoltaic panel, what should be included in the accounting? The energy needed to mine the bauxite for the aluminum frame? The energy needed to manufacture the heavy equipment that did the mining? The energy needed to construct the factory that produced the panel? Where the boundaries are drawn affects the final net energy ratios.

A society that depends on inexpensive energy to maintain a high standard of living and constant growth faces a predicament—it cannot maintain itself over the long run without high net energy fuels. Oil, natural gas, and coal have provided a huge, high-quality energy subsidy to the modern world. That subsidy, which has enabled human population and wealth to grow exponentially, is based on finite resources and cannot continue indefinitely. Renewable energy sources, excluding hydropower, are generally more diffuse and have lower net energy ratios than fossil fuels. If high net energy sources are in decline, and no reasonable replacements are available, the result may be a painful restructuring as society rearranges economic activity to fit a diminishing energy supply.

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Energy-fueled Economic Growth

World economic activity has historically grown slowly. From the Middle Ages to until the early eighteen hundreds, average per capita income rose only about 50 percent. But since the advent of the Industrial Revolution the pace has picked up, with global per capita income rising more than eightfold in just the last two hundred years.

Energy consumption has also risen dramatically, from under 20 gigajoules (GJ)³⁵ per person per year in the pre-industrial era to over 75 GJ per person today (and more than 300 GJ per person in the United

³⁵ One joule is defined as the work required to produce one watt of power for one second. A gigajoule is a billion joules

States). During this period, energy consumption and economic activity have stoked each other in a self-reinforcing feedback loop. Once the fossil fuel tap was opened for the modern world in eighteenth-century Britain, the high-energy content of coal (and, later, oil) enabled unprecedented productivity—spurring more consumption, more demand for energy, and better technology to get at yet more fossil fuels.

Despite the clear link between energy and economic growth, economists have interpreted and normalized growth as resulting from factors such as “market efficiency” and “labor productivity,” which (it is assumed) can be counted upon to produce more and more growth, ad infinitum. Policy makers have therefore built dependence on growth into the design of our economic system. Investors demand constant growth and high rates of return. Future growth is assumed to wipe away the debts taken on today by governments, businesses, and households. Most Americans are even betting their retirement savings, sitting in mutual funds on Wall Street, on continued growth.

As the global bonanza of cheap fossil fuels winds down, what will happen to economic growth? Certainly it’s possible to get more benefit per joule through smarter use of energy, but using energy efficiency to “decouple” economic growth from energy consumption can only go so far. After the easy efficiencies are found, further efficiency measures often require greater cost for less benefit; and while greater efficiency may reduce costs at first, it can have the effect of spurring yet more consumption.

It’s intuitively clear that it takes energy to do things, and modern civilization has exploited high-energy-content fossil fuels to dramatically reshape the living conditions and experiences of billions of people. (Altering the climate and destroying natural ecosystems around the globe were unintended consequences.) In the future, humanity will need to cope with both more expensive energy and less energy available per capita. Maintaining an acceptable level of productivity—let alone growth—may constitute one of society’s foremost social, political, technical, and economic challenges.

Energy Density

Different fuels contain more or less potential energy per unit of weight or volume, and even within fuel types, such as wood or coal, the heat value varies. Anthracite packs more energy than bituminous coal, and putting oak rather than pine in the woodstove before bedtime makes a big difference in how warm the house will feel on a winter morning. The fossil fuel age has been such a bonanza because oil and coal are extremely energy-dense fuels. They have benefited from the long work of geological processes to concentrate the carbon molecules from ancient plant and animal matter.

On average, coal has approximately twice the energy density of wood. Liquid fuels refined from petroleum including gasoline, kerosene, diesel, and heating oil all contain more than three times the energy value of wood. It is no accident that when human societies have had the opportunity to transition from locally harvested biomass to concentrated fossil energy fuels, they have chosen to do so.

The miraculous quality of fossil fuel energy density is easy to understand if one imagines trying to push an automobile for twenty miles. Given enough time, and some help from athletic friends, it would be

possible to push a 3,000-pound car that distance. But it would require a tremendous amount of effort. And yet a mere gallon of gasoline (which, despite recent price increases, still costs far less in the United States than an equivalent amount of good coffee) can easily power a car that far in the time it takes to drink a mocha latte. The fact that renewable energy is, in general, more diffuse than fossil fuel presents the primary challenge to transitioning from the current energy economy to a renewables-powered future.

Peak Oil and Resource Depletion

Every individual gas or oil well, every oil field, and every oil-producing country experiences a similar lifecycle. After a well is drilled, extraction ramps up to its maximum sustained output and eventually begins to decline as the reservoir is depleted. Then we search for the next well, which is generally a little harder to find, a little more expensive to produce. The price of any fossil energy determines what reserves are economically recoverable, and technological innovations can temporarily reverse the decline or extend well life. But as with any finite, nonrenewable resource—coal, natural gas, uranium, etc.—depletion is inevitable at some point.

In recent years, a large body of literature has begun exploring the many ramifications of “peak oil”—the moment when aggregate global oil production reaches its apex. The late American geologist M. King Hubbert predicted in the mid-1950s that U.S. oil production would reach the top of its production curve around 1970 and then begin to decline. That assessment was remarkably prescient: America’s production of crude did peak in 1970 and has been generally declining since, despite the addition of new sources on the Alaska North Slope and in the Gulf of Mexico. The United States, the first great power of the oil age, was also the first nation to explore, exploit, and begin to deplete its conventional oil reserves.

Oil of course is a global commodity. From a global perspective, reaching Hubbert’s peak means that roughly half of the world’s total oil resources are still in the ground, waiting to be tapped. Practically, however, the second half of the global oil resource is more difficult to access, making it less profitable (in terms of net energy) and more environmentally destructive than the earlier-exploited reserves.

The exact timing of the global oil production peak will only be recognizable in hindsight. Some energy experts predict that the peak will occur sometime during the first two decades of the twenty-first century. Others project continued growth in oil extraction through 2050. Based on data published by the International Energy Agency, global conventional oil production has been essentially flat since 2004, despite record-high prices, and likely peaked in 2006. Increased production of unconventional oil (deepwater oil, tar sands, oil shale, and shale oil) is officially projected to help meet growth in demand in the near future, but some energy experts insist that new production from these sources will be unable to make up for accelerating declines in production from conventional oil fields. Whether peak oil has occurred, is imminent, or remains years or decades off makes little difference to the salient fact: the era of abundant, inexpensive oil is closing, and all the systems for modern life designed around that earlier reality are bound to be affected.

Embodied Energy

Every material artifact—a carrot bought at the grocery store, the cooler where it was displayed, the supermarket building, the car driven there, and the road network it travels—requires a certain amount of energy in its manufacture, maintenance, and eventual disposal. The methods used to analyze the total embodied energy of manufactured objects vary, but in general, studies over the decades have used life-cycle analysis to quantify embodied energy in computers, household appliances, automobiles, and other common products.

The embodied energy in our physical infrastructure—from water mains and buildings to superhighways and airports—is immense, and thus infrastructure is one of the most important areas where energy use (and associated greenhouse gas pollution) could be reduced. In addition to building smaller, or building less, we can also build differently. Wood, for example, has the lowest embodied energy of common building materials; plastic has approximately six times as much embodied energy by weight, glass 16 times as much, steel 24 times as much, and aluminum a whopping 126 times as much embodied energy as wood. Erecting the scaffolding of civilization took a great deal of energy, and maintaining and expanding it takes more all the time. This vast amount of embodied energy, along with psychological and financial investments in the current energy distribution system, is a key obstacle to fundamental changes in that system.

Another useful metaphor that communicates the idea of embodied energy across a product's life cycle is the “energy train.” Take for example that ubiquitous artifact of modern civilization, the mobile phone. To its owner, a cell phone is simply a handy gadget that offers convenience and a feeling of connection. But the phone does not exist in isolation—it isn't a single locomotive chugging down the tracks; rather, it pulls a train of cars behind it, all of which have ecological and energetic costs. Those metaphorical railroad cars are filled with packaging to ship the phone; an advertising industry to inculcate desire for it; a retail store to sell it; a communications network that allows it to function; an assembly plant to build it; factories to manufacture plastic cases and computer chips and other components; mines where copper, silver, and rare earth elements are dug from the ground; the transportation infrastructure to move raw materials; and of course the energy system (oil wells, coal mines, power plants, hydroelectric dams, etc.) that support the entire operation. It is a very long train, and every car being pulled along must be in place for even one mobile phone to make its first call.

Energy Sprawl

The foremost criterion by which to judge any existing or potential energy source is its systemic ecological impact. A key subset of this analysis is its physical footprint. The useful term “energy sprawl” refers to the ever-increasing area—on land and offshore—that is devoted to energy production. Quantifying the area affected by different energy sources raises challenging methodological questions. It's obvious, for instance, to take into account the drilling pad when considering the energy sprawl impact of oil and gas development. But one should also include the land affected by pipelines, access roads, refining facilities, and other related infrastructure in the calculation. Nuclear power plants occupy

a small area relative to their electrical generation output, the smallest physical footprint of any major energy source. That energy sprawl impact grows considerably, however, when one factors in uranium prospecting, mining, processing, nuclear waste disposal, and any new power lines needed for an expanded nuclear industry. Moreover, as past accidents have demonstrated, when nuclear power plants fail, a large area can be contaminated.

Because of their high energy densities, coal, oil, and natural gas have a medium-size footprint if judged on an energy-output-per-acre ratio; but in practice these extractive industries affect a huge and growing area because they dominate energy production, and because of the enormous quantities of energy being consumed. Oil shale development in the American West is a potential area of fossil fuel exploitation that would create massive energy sprawl. Renewables, which harness the diffuse energy sources of wind and solar power, can have a large physical footprint relative to energy produced; they constitute such a small part of the current energy mix in North America that their aggregate energy sprawl impact at present is modest but growing. Because wind turbines require minimum spacing distances to maximize wind energy capture, the physical footprint of wind power is extensive but can be mitigated, whereas decapitated mountains in Appalachia sacrificed for surface coal mining will never grow back. Siting wind turbines in existing agricultural landscapes need not fragment any additional wildlife habitat. Putting solar arrays on rooftops, parking lots, and urban brownfields need not contribute to energy sprawl at all while generating significant energy close to where it is needed, eliminating the sprawl precipitated by new transmission lines.

Devoting land to growing feedstock for liquid biofuels, or growing biomass for generating electricity, augurs the greatest potential energy sprawl of the major energy alternatives under discussion. The energy density of these fuels is low and the amount of land that must be effectively industrialized, even for relatively small quantities of biofuels or biomass-derived electricity, is massive. In the end, the most effective strategy for fighting energy sprawl is to reduce energy consumption.

Energy Slaves

During the vast majority of our species' history, work was done by human muscles (sometimes the muscles of human beings enslaved by others). After people learned to domesticate wild creatures, beasts of burden such as oxen and horses added to our ability to harness the Sun's energy—captured by plants and channeled into the muscles of work animals. (This relationship between domestic animals and the machines we use today is enshrined in the "horsepower" rating of modern engines.) More recently, people began using wind and waterpower to amplify human labor. But with the dawn of the fossil fuel age, the average person was able to command amounts of energy previously available only to kings and commanders of armies.

Where people or work animals formerly toiled in the fields, the petroleum-powered machines of industrial agriculture now do the work of growing food. Need to be on the other side of the planet tomorrow? Jet travel can get you there. Want to sit in the sunshine, gamble, and overeat with a few thousand strangers in a gigantic floating hotel? The cruise "industry" can make your dreams come true.

Energy-dense fossil fuels make the seemingly impossible or ridiculously extravagant whims of people a reality.

In effect, the modern energy economy provides power equivalent to that of vast numbers of human or animal servants. That is the idea behind the concept of “energy slaves.” Although top athletes can do far better, a typical adult male at sustained labor is estimated to produce 75 to 100 watts of power. Calculate the total energy use of an average American and it seems that there are the energetic equivalent of more than 100 energy slaves working around the clock to prop up the easy lifestyle offered by modern civilization.

Energy Future: A Positive Vision

Everyone engaged in combating human-caused climate change or specific elements of the current energy economy knows that the work is primarily oppositional. It could hardly be otherwise; for citizens who care about ecological integrity, a sustainable economy, and the health of nature and people, there is plenty to oppose—burgeoning biomass logging, mountaintop-removal coal mining, inadequately regulated natural gas and oil drilling, poorly sited solar and wind developments, river-killing megadams, and new nuclear and coal plants around the globe. These and many other fights against destructive energy projects are crucial, but they can be draining and tend to focus the conversation in negative terms. Sometimes it’s useful to reframe the discourse about ecological limits and economic restructuring in positive terms, that is, in terms of what we’re for. The following list is not comprehensive, but beauty and biodiversity are fundamentals that the energy economy must not diminish. And energy literacy, conservation, relocation of economic systems, and family planning are necessary tools to achieve our vision of a day when resilient human communities are embedded in healthy ecosystems and all members of the land community have space enough to flourish. In short, what we’re for is leaving behind the current energy economy, which is wasteful, polluting, and centralized; assumes perpetual growth; and is anchored by nonrenewable fuels. We envision a bold leap toward a future energy economy that fosters beauty and health; that is resilient because it emphasizes renewable, community-scale energy generation; that supports durable economies, not growth; and that is informed by nature’s wisdom. Recognizing that all human economic activity is a subset of nature’s economy and must not degrade its vitality is the starting point for systemic transformation of the energy system. While such a transition may seem daunting, reforms may be implemented incrementally, and the destination offers exciting possibilities for building vibrant human communities embedded in healthy ecosystems.

Energy Literacy

Energy is arguably the most decisive factor in both ecosystems and human economies. It is the fulcrum of history, the enabler of all that we do. Yet few people have more than the sketchiest understanding of how energy makes the world go around. Basic energy literacy consists of a familiarity with the laws of thermodynamics, and with the concepts of energy density and net energy (also known as energy return on energy invested, or EROEI). It requires a familiarity with the costs and benefits of our various energy sources—including oil, coal, gas, nuclear, wind, and solar. It also implies numeracy—the ability to

meaningfully compare numbers referring to quantities of energy and rates of use, so as to be able to evaluate matters of scale. Without energy literacy, citizens and policy makers are at the mercy of interest groups wanting to sell us their vision and products for the future energy economy. We hear from the fossil fuel industry, for example, that Canada's oil reserves (in the form of "tar sands") are second only to Saudi Arabia's, or that the United States has over one hundred years of natural gas thanks to newly tapped "shale gas" resources. And it's tempting to conclude (as many people do) that there are no real constraints to national fossil fuel supplies other than environmental regulations preventing the exploitation of our immense natural treasures. On the other end of the spectrum, we hear from technooptimists that, with the right mix of innovative energy generation and efficiency technologies, we can run the growth economy on wind, solar, hydropower, and biofuels. And it's tempting to conclude that we only need better government incentives and targeted regulatory reform to open the floodgates to a "green" high-tech sustainable future. Energy literacy arms us with the intellectual tools to ask the right questions: What is the energy density of these new fossil fuel resources? How much energy will have to be invested to produce each energy unit of synthetic crude oil from oil shale, or electricity from thin-film solar panels? How quickly can these energy sources be brought online, and at what rate can they realistically deliver energy to consumers? When we do ask such questions, the situation suddenly looks very different. We realize that the "new" fossil fuels are actually third-rate energy sources that require immense and risky investments and may never be produced at a significant scale. We find that renewable energy technologies face their own serious constraints in energy and material needs, and that transitioning to a majority-renewable energy economy would require a phenomenal retooling of our energy and transportation infrastructure. With energy literacy, citizens and policy makers have a basis for sound decisions. Householders can measure how much energy they use and strategize to obtain the most useful services from the smallest energy input. Cities, states, and nations can invest wisely in infrastructure to both produce and use energy with greatest efficiency and with minimal damage to the natural world. With energy literacy, we can undertake a serious, clear-eyed societal conversation about the policies and actions needed to reshape our energy system.

Conservation

The current energy economy is toxic not simply because of its dependence on climate-altering fossil fuels, but also because of its massive scale and wastefulness. A first step toward reducing its global impacts is simply using less energy, a goal readily accomplished through conservation practices that are widely available and cost-effective. Energy conservation consists of two distinct strategies: efficiency and curtailment. Energy efficiency means using less energy to produce a similar or better service. For example, we can exchange old incandescent lightbulbs for compact fluorescents or LEDs that use a fraction of the electricity and still enjoy satisfactory levels of indoor illumination. Curtailment means exactly what you'd think: cutting out a use of energy altogether. In our previous example of indoor lighting, this strategy might take the form of turning off the lights when we leave a room. Efficiency is typically more attractive to people because it doesn't require them to change their behavior. We want services that energy provides us, not energy per se, and if we can still have all the services we want,

then who cares if we're using less energy to get them? Much has been achieved with energy efficiency efforts over recent decades, but much more remains to be done: Nearly all existing buildings need to be better insulated, and most electric power plants are operating at comparatively dismal efficiencies, to mention just two examples. Unfortunately, increasing investments in energy efficiency typically yield diminishing returns. Initial improvements tend to be easy and cheap; later ones are more costly. Sometimes the energy costs of retooling or replacing equipment and infrastructure wipe out gains from efficiency. Nevertheless, the early steps toward efficiency are almost always rewarding. While curtailment of energy use is a less inviting idea, it offers clearer savings. By simply driving fewer miles we unequivocally save energy, whether our car is a more or less efficient model. We've gotten used to using electricity and fuels to do many things that can be done well enough with muscle power, or that don't need doing at all. Conservation helps us appreciate the energy we use. It fosters respect for resources, and for the energy and labor that are embodied in manufactured products. It reduces damage to already stressed ecosystems and helps us focus our attention on dimensions of life other than sheer consumption. During the latter decades of the twentieth century, most Americans achieved a standard of living that was lavish from both historical and cross-cultural perspectives. They were coaxed and cajoled from cradle to grave by advertising to consume as much as possible. Simply by reversing the message of this incessant propaganda, people might be persuaded to make do with less—as occurred during World War II—and be happier as well. Many social scientists claim that our consumptive lifestyle damages communities, families, and individual self-esteem. A national or global ethic of conservation could even be socially therapeutic.

Resilience

Resilience is “the capacity of a system to withstand disturbance while still retaining its fundamental structure, function, and internal feedbacks.” Resilience contrasts with brittleness—the tendency to shatter and lose functionality when impacted or perturbed. Ecologists who study resilience in natural systems have noted that ecosystems tend to progress through a series of phases: growth, consolidation and conservation, release (or “collapse”), and reorganization. Each turning of this adaptive cycle provides opportunities for individual species and whole systems to innovate in response to external and internal change (i.e., disturbance). Resilient ecosystems (in the early growth phase) are characterized by species diversity; many of the organisms within such systems are flexible generalists, and the system as a whole contains multiple redundancies. In contrast, less resilient ecosystems tend to be more brittle, showing less diversity and greater specialization particularly in the consolidation phase. Resilience can be applied to human systems as well. Our economic systems, in particular, often face a trade-off between resilience and efficiency. Economic efficiency implies specialization and the elimination of both inventories and redundancy (which typically guarantee greater resilience). If a product can be made most cheaply in one region or nation, manufacturing is concentrated there, reducing costs to both producers and consumers. However, if that nation were to suddenly find it impossible to make or ship the product, that product would become unavailable everywhere. Maintaining dispersed production and local inventories promotes availability under crisis conditions, though at the sacrifice of economic efficiency (and profits) in “normal” times. From a resilience perspective one of the most vulnerable

human systems today is the American transportation system. For over seventy years we've spent trillions of dollars building transportation infrastructure that is completely dependent (i.e., "specialized") on affordable petroleum fuels, and we've removed or neglected most alternative methods of transport. As petroleum fuels become less affordable, the effects reverberate throughout the system. Resilience becomes more of a priority during periods of crisis and volatility, such as the world is experiencing today. Households, towns, and regions are better prepared to endure a natural disaster such as a flood or earthquake if they have stores of food and water on hand and if their members have a range of practical self-sufficiency skills. While the loss of economic efficiency implies trade-offs, resilience brings incidental benefits. With increased local self-sufficiency comes a shared sense of confidence in the community's ability to adapt and endure. For the foreseeable future, as global energy, finance, and transport systems become less reliable, the rebalancing of community priorities should generally weigh in favor of resilience.

Eco-Localism

A central strategy needed to increase societal resilience is localization—or, perhaps more accurately, relocalization. Most pre-industrial human societies produced basic necessities locally. Trade typically centered on easily transportable luxury goods. Crop failures and other disasters therefore tended to be limited in scope: If one town was devastated, others were spared because they had their own regional sources—and stores—of necessities. Economic globalization may have begun centuries ago with the European colonization of the rest of the world, but it really took hold during the past half century with the advent of satellite communications and container ships. The goal was to maximize economic growth by exploiting efficiency gains from local specialization and global transport. In addition to driving down labor costs and yielding profits for international corporations, globalization maximized resource depletion and pollution, simplified ecosystems, and eroded local systems resilience. As transport fuel becomes less affordable, a return to a more localized economic order is likely, if not inevitable. The market's methods of rebalancing economic organization, however, could well be brutal as global transport networks become less reliable, transport costs increase, and regions adapt to less access to goods now produced thousands of miles away. Government planning and leadership could result in a more organized and less chaotic path of adaptation. Nations can begin now to prioritize and create incentives for the local production of food, energy, and manufactured products, and the local development of currency, governance, and culture. Natural ecological boundaries—such as watersheds—bordered traditional societies. Bioregions defined by waterways and mountain ridges could thus become the basis for future relocalized economic and political organization. Deliberate efforts to relocalize economies will succeed best if the benefits of localism are touted and maximized. With decentralized political organization comes greater opportunity for participation in decision making. Regional economic organization offers a wide variety of productive local jobs. Society assumes a human scale in which individuals have a sense of being able to understand and influence the systems that govern their lives. People in locally organized societies see the immediate consequences of their production and waste disposal practices, and are therefore less likely to adopt an "out of sight, out of mind" attitude toward resource depletion and pollution. Local economic organization tends to yield art,

music, stories, and literature that reflect the ecological uniqueness of place—and local culture in turn binds together individuals, families, and communities, fostering a sense of responsibility to care for one another and for the land.

Beauty

Discussions about energy rarely focus on beauty. But the presence or absence of this ineffable quality offers us continual clues as to whether or not society is on a regenerative and sustainable path, or on the road to further degrading nature. From the time of the earliest cave paintings, human ideals of beauty have been drawn from the wild world. Animals, plants, rivers, oceans, and mountains all tend to trigger a psychological response describable as pleasure, awe, and wonder. The sight of a great tree or the song of a goldfinch can send poets and mystics into ecstasy, while the deep order inherent in nature inspires mathematicians and physicists. Nature achieves its aesthetic impact largely through anarchic means. Each part appears free to follow its own inner drives, exhibiting economy, balance, color, proportion, and symmetry in the process. And all of these self-actualizing parts appear to cooperate, with multiple balancing feedback loops maintaining homeostasis within constantly shifting population levels and environmental parameters. The result is beauty. Ugliness, by contrast, is our unpleasant aesthetic response to the perception that an underlying natural order has been corrupted and unbalanced—that something is dreadfully out of place. Beauty is a psychological and spiritual need. We seek it everywhere and wither without it. We need beauty not as an add-on feature to manufactured products, but as an integral aspect of our lives. With the gradual expansion of trade—a process that began millennia ago but that quickened dramatically during the past century—beauty has increasingly become a valuable commodity. Wealthy patrons pay fortunes for rare artworks, while music, fashion, architecture, and industrial design have become multibillion-dollar industries. Nature produces the most profound, magnificent, and nurturing examples of beauty in endless abundance, for free. Industrialism, resulting from high rates of energy use, tends to breed ugliness. Our ears are bombarded by the noise of automobiles and trucks to the point that we can scarcely hear birdsong. The visual blight of highways, strip malls, and box stores obscures natural vistas. With industrial-scale production of buildings, we have adopted standardized materials produced globally to substitute for local, natural materials that fit with their surroundings. But industrialism does not just replace and obscure natural beauty—it actively destroys it, gobbling up rivers and forests to provide resources for production and consumption. Large-scale energy production—whether from coal mines and power plants, oil derricks and refineries, or massive wind and solar installations—comes at a cost of beauty. While some energy sources are inherently uglier than others, even the most benign intrude, dominate, and deplete if scaled up to provide energy in the quantities currently used in highly industrialized nations. The aesthetic impact of industrial processes can be mitigated somewhat with better design practices. But the surest path to restoring the beauty of nature is to reduce the scale of human population and per capita production and consumption. Returning to a sustainable way of life need not be thought of as sacrifice; instead it can be seen as an opportunity to increase aesthetic pleasure and the spiritual nourishment that comes from living in the midst of incalculable beauty.

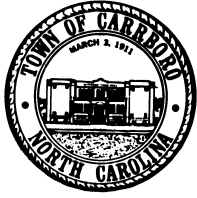
Biodiversity

The family of life on Earth is large: More than a million species have been identified and formally described by taxonomists, and estimates of the total number of species on the planet range from 3 million to 100 million. We humans depend for our very existence on this web of life of which we are a part. Indeed, it is part of us: Each human is inhabited by thousands of species of microbes that enable digestion and other basic functions. Yet through our species' appropriation and destruction of natural habitat we are shredding microbial, forest, prairie, oceanic, riparian, desert, and other ecosystems. Habitat loss, overharvesting, climate change, and other results of human numbers and behavior endanger untold numbers of species with extinction. Extinction is nothing new: It is an essential part of the process of evolution. Throughout the billions of years of life's history, life forms have appeared, persisted for thousands or millions of years, and vanished, usually individually but occasionally in convulsive mass events triggered by geological or astrophysical phenomena. There were five ancient extinction events so catastrophic that 50–95 percent of all species died out. Today humans are bringing about the sixth mass extinction in the history of life on Earth. While the normal rate of extinction is about one in a million species per year, the extinction rate today is roughly a thousand times that. According to recent studies, one in five plant species faces extinction as a result of climate change, deforestation, and urban growth. One of every eight bird species will likely be extinct by the end of this century, while one-third of amphibian and one-quarter of mammal species are threatened. As species disappear, we are only beginning to understand what we are losing. A recent United Nations study determined that businesses and insurance companies now see biodiversity loss as presenting a greater risk of financial loss than terrorism—a problem that governments currently spend hundreds of billions of dollars per year to contain or prevent. Nonhuman species perform ecosystem services that only indirectly benefit our kind, but in ways that often turn out to be crucial. Phytoplankton, for example, are not a direct food source for people, but comprise the base of oceanic food chains, in addition to supplying half of the oxygen produced each year by nature. The abundance of plankton in the world's oceans has declined 40 percent since 1950, according to a recent study, for reasons not entirely clear. This is one of the main explanations for a gradual decline in atmospheric oxygen levels recorded worldwide. Efforts to determine a price for the world's environmental assets have concluded that the annual destruction of rainforests alone entails an ultimate cost to society of \$4.5 trillion—roughly \$650 for each person on the planet. Many species have existing or potential economically significant uses, but the value of biodiversity transcends economics: The spiritual and psychological benefits to humans of interaction with other species are profound. Most fundamentally, however, nonhuman species have intrinsic value. Shaped by the same forces that produced humanity, our kin in the community of life exist for their own sake, not for the pleasure or profit of people. It is the greatest moral blot, the greatest shame on our species, for our actions to be driving other life forms into the endless night of extinction.

Family Planning

The human demographic explosion, amplified by rapacious consumption in the overdeveloped world, is at the root of the global eco-social crisis. Virtually every environmental and social problem is worsened by overpopulation. With more mouths to feed—and freshwater becoming scarcer and topsoil eroding—

global famine becomes an ever-greater likelihood. An expanding population leads to increased consumption of just about every significant resource, and thus to increasing rates of ecological damage, from deforestation to climate change. Family planning helps avert those threats. If we want future generations to enjoy a healthy planet with wild spaces, biodiversity, abundant resources, and a livable climate we should reduce fertility now. But family planning can do more than mitigate future resource depletion; it has direct and in some cases nearly immediate benefits. Some of those benefits are economic. For example, Ireland's declining birth rate in the 1970s is often credited as one of the factors leading to its economic boom in the 1980s and 1990s. China's one-child policy similarly contributed to its economic ascendancy. The mechanism? In poor societies where family size is typically large, all household income must go toward food and shelter, and none is left over for education and business formation. If the birth rate is reduced, household income is freed up to improve quality of life and economic prospects for the next generation. Without access to contraceptives, the average woman would have from 12 to 15 pregnancies in her lifetime. In contrast, women in industrial nations want, on average, only two children. It turns out that when women are economically and— this is critical—culturally empowered to make decisions about their own fertility, the result is improved health for mother and children, fewer unplanned pregnancies and births, and reduced incidence of abortion. Numerous studies have shown that women who have control over their fertility also tend to have more educational and employment opportunities, enhancing their social and economic status and improving the wellbeing of their families.



TOWN OF CARRBORO

PLANNING BOARD

301 West Main Street, Carrboro, North Carolina 27510

Thursday, September 17, 2015

Comments - Community Climate Action Plan

The Community Climate Action Plan is admirably exhaustive, thoughtful and thought provoking. The Planning Board commends the members of the Energy and Climate Action Task Force for the time and expertise they clearly poured into this document. We respectfully submit the following comments and questions.

General comments and questions:

- The Board's overriding concern is the absence of a measurable way to demonstrate progress toward the Plan's goals. Similarly, the Plan is vague about how individual recommendations will be evaluated. The Board recognizes that this is a tall order but believes it is critical to the Plan's success.
- The Plan is written in a dense and occasionally jargon-y way. It often refers to language or concepts that may not be familiar to a lay audience. If presented to the public, it should be trimmed and edited for impact and accessibility.
- The Board suggests clarifying the goal itself. The goal (p. 5) proposes a 50% reduction for "Town operations" and the "business and transportation 'sectors'" (presumably those operated by the Town) within ten years. The 50% reduction is expected to extend "ultimately" to residents and businesses. Are these two separate goals? Will a more precise deadline be set in the future for residents and businesses? It is hard to convey urgency and galvanize change with a fuzzy statement and imprecise timeline.
- Approximately how much will implementation of the Plan cost? Is it possible to estimate a budget?
- Most recommendations come with an introductory section that connects the proposed action with climate change mitigation. It would be helpful if this is done consistently throughout the Plan.
- The Board supports the hiring of a coordinator, either full-time in Carrboro, or shared with another jurisdiction, perhaps Hillsborough or Pittsboro.

- Sustainability should be recognized as a civic virtue. The Plan does a good job of addressing and involving all the local-level participants shown in Table 1 (p.8). It fosters a sense of engagement and “we’re all in this together”-ness that can drive real behavioral change.

Comments about specific recommendations:

Community Integration

- Rec. #2 – The Plan is right to emphasize partnerships with existing organizations. This leads to cost savings, accelerated learning, broader outreach and more. Composting and storm water utility are two areas noted in the report where partnerships seem particularly suited.
- Rec. #6 – singled out for support.

Buildings

- Rec. #3 – The state building code is one of the most stringent in the nation and largely outside the ability of the town to control. Other voluntary forms of certification like LEED already exist. This may not be the most fruitful place to expend effort.

Transportation

- Rec. #3 – The connection between Carrboro and more regional bus routes is poor. Good to see expansion of service identified here and a lot more can be accomplished.
- Rec. #6 – Nice idea. It’s a simple step that can have real impact.

Renewable Energy

- Rec. #1 – Members of the Board voiced support for the idea of Carrboro becoming a utility provider. While there are real legislative, financial and administrative hurdles, the town should at least make the attempt. Also, the town should support, by messaging the state and our state representatives, continuing tax credits for sustainable efforts - solar, solar hot water, geothermal, etc.
- Rec. #2 – Also received support from Board members, who likened bonds to old-fashioned crowd sourcing (i.e., “gives citizens a chance to put their money where their mouths are”).

Ecosystem Protection and Enhancement

- Rec. #1 – The Board liked the idea of a storm water utility. Even if a separate utility is not created, a storm water fee should be set aside from general revenues. It seems better to collect this along with property taxes since a small monthly or quarterly bill would be annoying and expensive to process.
- Rec. #3 – Board members expressed two thoughts here. The first was that the county, not the town, is the most qualified entity to run a composting collection program. The county is already skilled in the collection of material and the maintenance of collection centers, and it manages the end of the flow - the landfills. The second noted the savings to the town through reduced tipping fees as well as a benefit to OWASA thanks to the reduction of compostable material that is currently run through garbage disposals.

Environmental Advisory Board
301 West Main Street, Carrboro, North Carolina 27510

R E C O M M E N D A T I O N

THURSDAY, OCTOBER 1, 2015

Draft Community Climate Action Plan Review

Stormwater Funding Resolution

Motion made by Reddy and seconded by Crook that the EAB pass on the following resolution to the Climate and Energy Task Force, the Board of Aldermen, and staff.

Whereas, Carrboro's Energy and Climate Task Force has recommended that the Town pursue the formation of a stormwater utility, or join Chapel Hill's utility; and

Whereas, benthic monitoring has identified concerns for the health of Bolin Creek for over a decade, and stormwater runoff impacts Morgan Creek and other creeks in Carrboro; and

Whereas, the EAB believes that the Town is responsible not only for surface water protection from new development but also for surface water restoration from many decades of neglect; and

Whereas, the EAB commends the Town for taking steps to exceed minimum State requirements for stormwater volume control and water quality buffers for new development, for past work with the Bolin Creek Watershed Restoration Team to restore the aquatic health of Bolin Creek, and in general for land use planning and policies that have to some extent reduced surface water impacts from new development and exceeded what many other jurisdictions have pursued in recent years; and

Whereas, the Town participated in the development of a Watershed Restoration Plan for Bolin Creek, but has not been able to maintain momentum or pursue implementation with watershed restoration efforts in the absence of prioritization of the plan through dedicated funding and additional Town capacity; and

Whereas, the EAB believes that watershed restoration progress will be severely hindered if not impossible by relying strictly on very limited and occasional grant funding; and

Whereas, the EAB aspires to the Town exceeding its NPDES Phase II stormwater permit requirements rather than minimally complying with the requirements; and

Whereas, the Jordan Lake Existing Development Rules will place a significant multimillion dollar financial burden on the Town in the next decade; and

Whereas, the extent of the current approach to planning for the Jordan Lake Existing Development Rules financial burden is to include identified projects in the Town's Capital Improvement Program; and

Whereas, citizens of the Town regularly experience flooding impacts, however, the Town has not yet been able to holistically or proactively respond to these impacts; and

Whereas, it is predicted that Carrboro will experience more frequent heavy rain events and associated stormwater management challenges in light of climate change; and

Whereas, the EAB concludes that Carrboro needs dedicated, predictable and considerably more funding to improve stormwater management efforts; and

Whereas, Chapel Hill has formed a stormwater utility that has significantly increased Chapel Hill's ability to more proactively manage stormwater and includes a diversity of full time professional staff, including staffing to help citizens understand the causes and consequences of stormwater runoff and the ways in which individuals can limit the polluted runoff leaving their property; and

Whereas, stormwater utilities are an increasingly adopted best practice in North Carolina and elsewhere. According to the UNC Environmental Finance Center; there are currently 55 utilities operating in North Carolina, including many utilities in small towns; and

Whereas, the EAB believes that, by reference, the typical/average stormwater utility fee of \$1/month/1000 sq. ft. of impervious surface for North Carolina stormwater utilities is one which a majority of Carrboro residents would be willing to pay if the revenue is well managed, especially if provisions are included so that the fee structure not be burdensome to lower income residents.

Therefore, the EAB recommends that the Town prioritize efforts to investigate and pursue means for financing stormwater management efforts that create a dedicated, long term, sustainable, and equitable funding stream to better manage stormwater runoff and improve local stream health; and

Furthermore, the EAB endorses the Task Force's recommendation and specifically recommends that, at a minimum, the Town consider either joining Chapel Hill's stormwater utility or creating a new stormwater utility.

VOTE:

AYES: Crook, O'Connor, Patrick, Reddy, Sinclair, Turner

ABSENT/EXCUSED: Cotter

NOES: None

ABSTENTIONS: None

Deer Herd Management Resolution

Motion made by Turner and seconded by Crook that the EAB pass on the following resolution to the Climate and Energy Task Force, the Board of Aldermen, and staff.

Whereas, Carrboro's Energy and Climate Task Force has recommended that the Town pursue a deer herd management program; and

Whereas, studies have shown that excess deer are adversely affecting the health of our forests, which are carbon sinks, by causing a decrease in plant diversity and aiding in the spread of exotic species; and

Whereas, soil studies have shown that the seed stores in areas with deer overpopulation are shifting from native wildflowers and woody plants to invasive plants and grasses; and

Whereas, the current deer herd population is probably on the order of 5-10 times the optimal size for overall ecosystem health; and

Whereas, a reduced/better managed deer population would also improve the overall health of the deer population and decrease the incidence of deer/vehicle collisions; and

Whereas, studies have found that the least expensive and most effective method for deer herd management is through culling programs, often focusing on an urban archery program that can be tailored to a community and also provide food to people in need; and

Whereas, such programs have been safely and successfully implemented in Duke Forest, Chapel Hill, Durham, Raleigh, Pittsboro and many other towns in North Carolina, and

Whereas, while culling can be seen as a safety issue, there have been no documented archery-related accidents in NC for the past 40 years; and

Whereas, the NC Wildlife Resources Commission and others are available to advise the Town about the feasibility of creating a program that is tailored to the needs of Carrboro and addresses all concerns.

Therefore, the EAB endorses the Task Force recommendation that Carrboro reopen the consideration of implementing its own deer herd management program to reduce negative impacts on forest regeneration and ecosystem health and biodiversity and protect our forests from an expanding deer population that is too large now and may grow; and

Furthermore, the EAB specifically recommends that the Town take whatever steps needed towards a goal of submitting a letter of intent to participate in the Urban Archery Season program of the NC Wildlife Resources Commission.

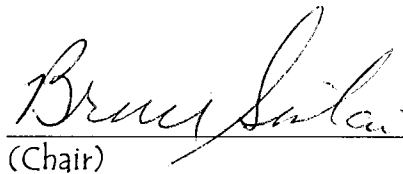
VOTE:

AYES: Crook, O'Connor, Patrick, Reddy, Sinclair, Turner

ABSENT/EXCUSED: Cotter

NOES: None

ABSTENTIONS: None


(Chair) 10/2/15
(Date)

Environmental Advisory Board
301 West Main Street, Carrboro, North Carolina 27510

R E C O M M E N D A T I O N

THURSDAY, NOVEMBER 5, 2015

Community Climate Action Plan Review

Motion made by O'Connor and seconded by Patrick that the EAB endorses the recommendations related to ecosystem protection and restoration in the Community Climate Action Plan.

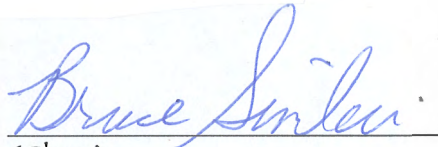
VOTE:

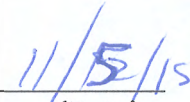
AYES: Cotter, Crook, O'Connor, Patrick, Reddy, Sinclair, Turner

ABSENT/EXCUSED: None

NOES: None

ABSTENTIONS: None


(Chair)


(Date)



TOWN OF CARRBORO

Transportation Advisory Board

301 West Main Street, Carrboro, North Carolina 27510

THURSDAY, OCTOBER 15, 2015

Transportation Advisory Board Comments re: Climate Action Plan

The Transportation Advisory Board discussed the Climate Action Plan. The TAB offers the following comments:

- Preamble

The TAB suggests the Climate Change Task Force move its Transportation Recommendation 1 to the preamble given how difficult a 50-percent reduction in GHG emissions by 2025 will be. It further recommends the preamble's focus be expanded to include wider societal demands that play into a carbon problem, along with possible solutions beyond bicycle/pedestrian infrastructure as well bus ridership, from carbon trading to possible tax breaks. The TAB has some concerns, moreover, with being asked in the Climate Change Task Force Report to take on numerous new tasks.

- Transportation Recommendation 1: 50% Challenge (Reduce GHG emissions by 50% by 2025).

The TAB lauds the Climate Change Task Force's high bar, but believes the goal's "achievability" will be difficult, certainly by the date of 2025. The TAB, therefore, recommends Transportation Recommendation 1 be included instead in the preamble to the task force's report, rather than as a recommendation. Specifically, the goal's "achievability" will be difficult without the wide-scale introduction of electric cars and other changes at a greater societal level.

When considering the reduction of GHG emissions, the Town of Carrboro should investigate a wide array of options, including but not limited to land-use patterns, reevaluation of current bus transit routes, improved bus-transit routes with expanded hours, the need for convenient circulator buses, a Bus Rapid Transit system, and working with business and non-profit partners to encourage employee flex time, remote-work possibilities, on-site daycare, business delivery services, and other offerings such as employee showers for those cycling to work, which have proven successful in the past.

- Transportation Recommendation 2: Improved Bike/Ped Infrastructure

The TAB recommends the Town of Carrboro conduct an updated, comprehensive reassessment of the Bolin Creek bike-path plan in terms of the need, utility, function, appropriateness and viability of completing Phases 3 and 4. Such a reassessment should include sufficient technical information to address all related climate-change impacts from GHG-emission reduction to stream protection, and include an updated alternative-route assessment. The UNC-constructed bridge that crosses Bolin Creek, moreover, has changed the pattern of pedestrian behavior, thereby making the possibility of a paved Bolin Creek greenway at this point, it is noted, somewhat redundant.

All current alignments, meanwhile, present practical difficulties, from topographical concerns to low-lighting in winter to issues of public safety to most likely limited commuter bike-ridership. The TAB, therefore, suggests the Town of Carrboro look at the entire upper Bolin Creek Watershed area, including land under the jurisdiction of its neighbors, Chapel Hill and UNC, with the intention of being complimentary with Chapel Hill's greenway plan.

The TAB suggests the completion and possible paving of the Bolin Creek bike path appears to be overemphasized in the report and does not integrate that well with current and specific planning related to various segments of the Town's bike/pedestrian efforts as discussed and weighed in on by the TAB. The costs, moreover, have yet to be defined. Given the controversy surrounding this matter, the TAB believes it to be beyond its purview to resolve this matter without more substantive background information, and believes a facilitation process may be required once the needed reassessment is completed.

Regarding the other recommendations under 2, the TAB strongly supports the Climate Change Task Force's recommendations, including its recommendation of "creating bicycle boulevards by adding traffic calming features" through its recommendation of "ensuring sufficient bike parking." The TAB has worked continuously on such matters. Suggested as well is that raingardens be used for traffic-calming, beautification and climate-protection measures as a component of the "Green Streets" recommendation, and that the Town of Carrboro seek funding for them.

- Transportation Recommendation 3: Enhanced Transit Service

The TAB suggests the focus be on existing bus lines, thereby increasing land-use efficiency by focusing on intensified land use along existing transit lines as a way to maximize the value of existing bus lines as opposed to creating new underutilized bus lines. The TAB advises an in-depth reevaluation of existing bus services as to frequency, days of service, the expansion of some existing routes and the shortening of others. The TAB believes a bus system with a better

routing system would be more friendly and efficient for citizens. Rogers Road also needs more service. Helpful as well would be the optimization of Carrboro's connection with Bus Rapid Transit.

- Transportation Recommendation 4: Improve Vanpool/Carpool Options

The TAB suggests a clarification be made when speaking of converting existing parking spaces. The way the recommendation is worded suggests new paving could be required where, instead, a good move is to increase *van share* parking spaces where appropriate.

The TAB encourages resources such as "Share the Ride," which attempt to promote carpooling.

- Transportation Recommendation 5: Additional Promotion of Walking, Biking, Transit

The TAB supports promotion, but believes there is a limit to the effectiveness of such promotion.

The TAB feels *lowering the speed limit recommendation* may not suffice as "promotion." Street redesign should be considered in conjunction with any reduction in speed limit. Street redesign also aids in enforcement of speed limits. Therefore, the TAB believes this recommendation should be relocated in the Climate Change Task Force's report. The TAB believes efforts to make the town more multi-use friendly should include not only street redesign and speed-limit reductions but also bike sharing (regional and local), traffic calming devices and the former TAB recommendation of a wider slow-zone downtown to include gateway architecture/art to define this zone.

The TAB supports the "Park and Stroll" recommendation as it promotes walking and vehicular efficiency, but such walking routes need to be shown to be safe.

The TAB suggests a bike-donation program be included in the recommendations. If bike sharing is to be considered, moreover, it should be done on a regional level, including not only across Carrboro but also across Chapel Hill and UNC.

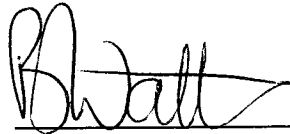
The TAB also suggests a neighborhood-based/community "walking school bus" program as a good promotional idea.

- Transportation Recommendation 6: Idling in School Zones

The TAB believes this recommendation may suffer from enforceability problems. Moreover, it is somewhat over-specific in contrast to other recommendations. Therefore, the TAB suggests it be relocated to another recommendation, possibly number 1.

The TAB believes a concentration on education rather than enforcement will be most helpful. The TAB suggests working with the local school system to discuss opportunities for solutions to its related carbon footprint at its facilities. One possibility is a better drop-off system at schools. Another is ensuring school-bike parking (and enough of it) be available.

The TAB suggests there is value in looking again at the reduction of driving at the local high schools, for instance by adding multiple lunch periods, thus keeping students on campus for lunch. This, however, may be unpopular with constituents.

 For Linda Haac

Transportation Advisory Board Chair

11/6/15
Date

Frequently Asked Questions on a Carrboro Stormwater Utility

The Carrboro Energy and Climate Task Force has recommended that Carrboro pursue a stormwater utility, either by joining Chapel Hill's utility, or by creating its own utility. The Environmental Advisory Board and Planning Board have endorsed the recommendation. The reasons for the recommendation are provided in the Community Climate Action Plan. This document has been created as a first attempt to anticipate and respond to questions that community leaders and members may have.

[What mechanisms exist to fund stormwater management?](#)

[What is a stormwater utility?](#)

[Why is the Task Force recommending that Carrboro consider a stormwater utility rather than maintaining the status quo or pursuing a different approach?](#)

[How much does it currently cost the Town to manage stormwater?](#)

[How much would a stormwater utility cost Carrboro citizens? What's the risk of imposing a financial hardship on some citizens? How can this risk be minimized?](#)

[Are Carrboro citizens willing to pay more for better stormwater management?](#)

[Is there an alternative to a stormwater utility that will achieve the same results?](#)

[What are the pros and cons of pursuing a stormwater utility in partnership with Chapel Hill versus forming a Carrboro stormwater utility?](#)

[What are the steps to pursuing a stormwater utility?](#)

[What does it take to run a stormwater utility?](#)

[Who is available to help Carrboro leaders/community members understand stormwater financing in general and, more specifically, the possibility of pursuing a utility?](#)

[What communities in the Triangle and Triad area have stormwater utilities?](#)

What mechanisms exist to fund stormwater management?

A great majority of communities use one of two mechanisms to fund stormwater management programs: property taxes funneled through a General Fund (Carrboro's current approach) or via a stormwater utility, which is fee based. More and more communities have adopted the utility/fee approach. A challenge with using tax dollars through a general fund is that stormwater management competes with everything else, e.g., stormwater programs and improvements may not be funded unless the municipality is reacting to a recent major storm or regulatory action. This approach also is not inherently equitable because the basis for determining property taxes (assessed property value) is not necessarily related to the impact on runoff and cost of stormwater management for that property. Additionally, tax-exempt properties, such as governmental properties, schools, and churches do not support any of the cost of stormwater management, even though many of them are major contributors of stormwater runoff.

What is a stormwater utility?

A stormwater utility is a public utility organized as a separate enterprise in the same fashion as a water and sewer utility. It is a "stand-alone" service unit within the local government which generates revenues through fees that go into a separate fund that may only be used for stormwater services. A stormwater utility is responsible for stormwater system planning and management, with the details dependent on the scope of services a given local government chooses. Typically, a utility will have responsibilities such as: operating and maintaining a Municipal Separate Stormwater Sewer System ("MS4"--which is the stormwater conveyance system), including reducing flooding impacts on public and private property; providing regulatory oversight for new and existing development; supporting public participation and outreach and education; tracking and responding to illicit discharges and connections; and managing administrative responsibilities and compliance with State and Federal regulations.

Why is the Task Force recommending that Carrboro consider a stormwater utility rather than maintaining the status quo or pursuing a different approach?

Fundamentally, there are several reasons. Stormwater runoff is currently impacting surface waters, and the Task Force believes the Town has a responsibility to address these impacts to a greater degree than is currently happening, needs more revenue to manage stormwater, and that this need will only grow as climate changes. Needed revenues also will significantly increase soon as the Town implements requirements under the Jordan Lake rules; forming a utility would proactively address this rather than reactively in a manner which could result in a property tax increase and/or an inability to fund other important Town priorities. Furthermore, in the absence of a utility, and based on historical precedence, stormwater will receive a lower priority for funding than other Town services. A utility also creates a level playing field for assigning responsibility based on contribution to stormwater impacts. Finally, a utility creates a clear and accountable revenue/cost balance sheet and administrative unit for pursuing stormwater management.

How much does it currently cost the Town to manage stormwater?

The Town does not currently separately track revenue and expenditures for stormwater management, so, it is not possible to put a \$ figure on stormwater management. Subjectively, the costs are primarily associated with: salaries for several staff members who spend part of their time on stormwater

management; contract support for stormwater engineering review; and operational and maintenance expenses to maintain the stormwater conveyance system.

How much would a stormwater utility cost Carrboro citizens? What's the risk of imposing a financial hardship on some citizens? How can this risk be minimized?

Until Carrboro goes through the process of establishing a utility, or asks to join Chapel Hill's utility, it is not possible to nail down the details of a fee structure. It is possible to get a reasonable estimate through several reference points. Chapel Hill's stormwater utility had an annual budget of \$2.4M (2014); Durham's stormwater utility had an annual budget of \$12.5M (2012). This works out to \$40 per capita for Chapel Hill and \$46 per capita for Durham. (Note that Chapel Hill has a bond referendum that, if approved, will result in a slight increase in stormwater fees.) By association, Carrboro would have an annual budget of about \$800k if a similar level of service/revenue was sought. (This is slightly less than Carrboro currently pays as a partner in Chapel Hill Transit.) For an individual property owner, Chapel Hill currently charges \$26.15 per 1000 square feet of impervious surface per year. For a broader perspective, visit the [NC Stormwater Utility dashboard](#) maintained by the UNC School of Government Environmental Finance Center to compare stormwater fees charged by stormwater utilities in North Carolina¹. If a utility were formed, the dedicated revenue from fees would also mean that the General Fund revenue currently being used to support stormwater efforts would no longer be needed. The general idea of a utility is to balance costs and revenues from fees. Therefore, if a utility were to be pursued, in principal, the utility would pay for itself.

As far as addressing the potential for financial hardship for some citizens, the Task Force is aware that some communities outside of NC have addressed this by reducing or waiving the fee for property owners who meet certain financial hardship provisions. However, it is our understanding that [NC General Statutes](#) do not currently explicitly allow for this in the fee structure. [This link](#) explains how Chapel Hill considered this concern as Chapel Hill's utility was being formed, recognizing the ability to establish mechanisms for relief to those with hardship. (The Task Force has not checked with Chapel Hill regarding their implementation of any financial hardship related provisions.)

Are Carrboro citizens willing to pay more for better stormwater management?

The Task Force is not aware of an effort to poll the community, and defers to the Town on how to best pursue this question. We assert that a fee of the magnitude presented above is a reasonable and responsible expense to more proactively manage stormwater runoff.

Is there an alternative to a stormwater utility that will achieve the same results?

Carrboro could raise taxes, seek loans and grants, issue a bond, or some combination of these to generate more revenue for improved stormwater management. In our opinion, these approaches, singularly or in combination, provide a less satisfactory and equitable solution than the clear and dedicated approach of a utility.

¹ From the dashboard, there are 55 stormwater utilities in NC, including 31 in jurisdictions of Carrboro's size or smaller, and 11 in the Triangle and Triad. Comparisons can be made on the dashboard across subgroups of utilities with similar characteristics, such as location, EPA phase (1 for large municipalities and 2 for small municipalities), rate structure, and customer income levels.

What are the pros and cons of pursuing a stormwater utility in partnership with Chapel Hill versus forming a Carrboro stormwater utility?

The main pros are: Carrboro and Chapel Hill share the same watersheds (Bolin Creek and Morgan Creek) and therefore have mutual interests in collaborating; Chapel Hill has already figured out how to make a utility work, so Carrboro wouldn't have to reinvent the wheel; there are fiscal efficiencies/economies in joining forces; and Chapel Hill has very skilled and knowledgeable staff that have been working in the community from whom Carrboro could benefit. The main con is a lack of autonomy. More information about Chapel Hill's utility and the 19 services offered by the utility is available at [this link](#).

What are the steps to pursuing a stormwater utility?

The following are the typical steps involved in creating a stormwater utility (which Chapel Hill has already done).

- 1) Feasibility Study. A feasibility study provides the community with enough information to decide if implementing the utility is sensible. The feasibility study typically addresses preliminary revenue requirements, assesses the billing area to determine the billing rate, the service fee method to use and credits to provide, the preliminary rate structure, and the responsible party for billing.
- 2) Billing System. If the municipality decides after the feasibility study to develop a stormwater utility, it will then collect user and parcel area data (such as ownership and impervious area for each parcel) and develop a system to bill property owners. The two most common stormwater billing systems are adding a stormwater utility fee (1) onto an existing water/sewer fee bill, or, (2) non-ad valorem assessments. According to EPA, approximately 80 percent of stormwater utilities in the US use the first approach. Chapel Hill uses the second approach, which is likely (at least in part) a function of the difficulty of billing through OWASA since they are administratively more independent of municipal government.
- 3) Public Information Program. A strong public education program is critical throughout the stormwater utility development process. Many people are unaware of the increasing cost of stormwater management and the options to fund it. A well-funded stormwater program can help reduce flooding, improve conditions during droughts, and improve water quality and creek conditions. An organized public information and education effort, which typically involves the following components, is essential to the success of a stormwater utility:
 - a. Identify key users and groups. Two potential groups to target include (1) properties that generate a significant amount of runoff and may receive higher stormwater bills; and (2) tax-exempt properties (i.e., schools and churches) that do not contribute property taxes into the general fund (which has traditionally been the source of stormwater management funding).
 - b. Establish an advisory committee. Include a cross section of the community including representation from schools, businesses, non-profit organizations, churches, and developers.
 - c. Create a stormwater utility website. The website should post appropriate progress documents and update a frequently asked questions page.
 - d. Prepare pamphlets and presentations.

- 4) Implementation. The first utility bill is the most important because many will not focus on the new stormwater fee until they actually receive their first bill. The municipality should notify citizens their estimated fee several months before billing begins. It should create a telephone hot line, e-mail service and website to address questions and concerns. In addition, the municipality should be prepared to address legal challenges to its stormwater fee. The municipality should be prepared to develop a process to update the billing unit data for an existing customer or to enter the data for a new customer.

What does it take to run a stormwater utility?

Once a utility is established, staff are needed. In Chapel Hill, the staffing (13 people) includes administrative staff, stormwater engineers and technical staff, an outreach coordinator/educator, and staff that manage infrastructure and provide drainage assistance. Part of the administration and outreach is responding to questions and managing the billing. Many communities (including Chapel Hill) also have a separate advisory board solely dedicated to stormwater management.

Who is available to help Carrboro leaders/community members further understand stormwater financing in general and, more specifically, the possibility of pursuing a utility?

Besides consulting with other local governments, the way many municipalities handle obtaining the expertise to consider/establish a utility is to hire a consultant. There are numerous online resources to consider, with a recommended one in North Carolina being the [UNC School of Government Environmental Finance Center](#) which has a number of documents and slideshows online in addition to the dashboard mentioned above.

[What communities in the Triangle and Triad area have stormwater utilities?](#)

According to the UNC Environmental Finance Center dashboard, there are utilities in Chapel Hill, Durham, Raleigh, Greensboro, Burlington, Elon, Graham, Winston-Salem, High Point, Kernersville, and Thomasville. Hillsborough staff have indicated that there are discussions about a utility in Hillsborough.



Town of Carrboro

Town Hall
301 W. Main St.
Carrboro, NC 27510

Agenda Item Abstract

File Number: 15-0368

Agenda Date: 11/10/2015

File Type: Agendas

In Control: Board of Aldermen

Version: 1

TITLE:

Update on status of the Durham-Orange Light Rail Transit Project (D-O LRT)

PURPOSE: The purpose of this item is for the Board of Aldermen to receive an update on the project, and provide comments for DCHC-MPO Transportation Board

DEPARTMENT: Planning

CONTACT INFORMATION: Patricia McGuire- 919-918-7327 - pmcguire@townofcarrboro.org

INFORMATION: Transportation and land use planning in support of public transit has been underway in the Research Triangle region for many years. Light Rail Transit has been identified as an improvement that could expand transit options, foster compact development and serve populations with a high propensity for transit use. The current project concept was formalized in 2012 when the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization endorsed the 17-mile LRT between the University of North Carolina (UNC) Hospitals and Alston Avenue in east Durham as the Locally Preferred Alternative (LPA) for inclusion in the 2035 Long Range Transportation Plan (LRTP). Shortly thereafter, the Federal Transit Administration (FTA) issued a Notice of Intent to prepare an Environmental Impact Statement (EIS) as required by the National Environmental Policy Act (NEPA) for projects seeking federal action, including funds.

Notice of availability of the completed Draft Environmental Impact Statement (DEIS) for the proposed Durham-Orange Light Rail Transit (D-O LRT) Project was published in the Federal Register on August 28th, 2015; a 45-day public comment period began on that date. Over 1,300 comments were received and participation was high at public information sessions and hearings held in Chapel Hill and Durham. Review of the comments is underway and all will be addressed in the combined Final EIS and Record of Decision, scheduled for completion in February 2016. The DEIS and all public comments may be found on the project website at <http://ourtransitfuture.com/>.

The Board of Aldermen received a report on the project on May 5th and a letter of support from the Town Manager for the preferred alternative was submitted on October 13th (*Attachment B*). Patrick McDonough, Go Triangle's Manager of Planning and Transit Oriented Development will provide an update for the Board of Aldermen on the review of the alternatives and public comments received. The DCHC-MPO is scheduled to vote on the D-O LRT NEPA Preferred Alternative at its regular meeting on November 11th; comments on the project may be conveyed to that meeting via Mayor Lavelle or Alderman Seils. Background information on the

Agenda Date: 11/10/2015

File Type:Agendas

In Control: Board of Aldermen

Version: 1

project including a recent project newsletter and the timeline/summary are included as *Attachments C and D*.

FISCAL & STAFF IMPACT: None noted.

RECOMMENDATION: The staff recommends that the Board of Aldermen receive the update and provide comments to the MPO as it determines is appropriate. A resolution to convey any comments to the MPO via Town representatives Mayor Lavelle and Alderman Seils is provided as *Attachment A*.

A RESOLUTION COMMENTING ON THE DURHAM-ORANGE LIGHT RAIL TRANSIT (D-O LRT) PROJECT
PRIOR TO THE DCHC-MPO TRANSPORTATION BOARD NOVEMBER 11TH VOTE ON PREFERRED
ALTERNATIVE

WHEREAS, the Town has had a longstanding interest in transportation options for citizens; and

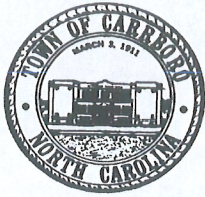
WHEREAS, the D-O LRT project would provide light rail access from UNC Chapel Hill to east Durham and many educational, medical, and employment centers along the way and

WHEREAS, GoTriangle staff are reporting on the project's status prior to DCHC-MPO Transportation Board November 11th vote on the preferred alternative.

NOW, THEREFORE, BE IT RESOLVED that the Board of Aldermen of the Town of Carrboro accepts the report and provides the following comments for the Town's DCHC-MPO Transportation Board members to offer at November 11th meeting:

1. _____
2. _____

This the 10th day of November in the year 2015.



TOWN OF CARRBORO
NORTH CAROLINA
WWW.TOWNOFCARRBORO.ORG

Attachment B-1

October 13, 2015

Jeff Mann
General Manager
Go Triangle
4600 Emperor Blvd., Suite 100
Durham, NC 27703

Subject: Letter of Support – Preferred Alternative for the Durham-Orange Light Rail Project

Dear Mr. Mann,

This letter conveys the support of the Mayor and Board of Aldermen for your agency's efforts to develop the Durham-Orange Light Rail Transit (D-O LRT) project. The town's policies and actions have supported the exploration and expansion of transportation alternatives, including rail, for many years. As a member of the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization, a longstanding partner in the provision of local bus service with Chapel Hill Transit, and as a potential future light rail transit extension destination, the Town endorses the NEPA preferred alternative and will be encouraging the MPO to endorse the Environmental Impact Statement preferred alternative when it votes on this matter in November.

Please contact me if you have any questions. I can be reached at (919) 918-7315 or dandrews@townofcarrboro.org.

Sincerely,

David L. Andrews
Town Manager

Durham-Orange Light Rail Transit Project (D-O LRT)

Attachment C-1

>> Newsletter 2014

Project Goals:

- Enhance mobility
- Expand transit options between Durham & Chapel Hill
- Serve populations with high propensity for transit use
- Foster compact development



Comments about the project and requests for speakers may be directed to:

Natalie Murdock
Public Involvement Manager
Our Transit Future
P.O. Box 530
Morrisville, NC 27560

info@ourtransitfuture.com
1-800-816-7817



Why propose a Light Rail Transit project? Long-term regional growth forecasts show population in the Triangle region increasing by 80 percent between 2010 and 2040, from 1.6 to 2.9 million. Within the Durham-Orange Light Rail Transit (D-O LRT) corridor, the population is forecast to double and the highest travel intensity (number of trips per acre) in the Triangle region are predominantly located in this corridor.

Where are people going? They are going to and from the major employment destinations at UNC Hospitals and Duke/VA Medical Centers, as well as Downtown Durham.

Project Milestones Accomplished

- On February 8, 2012, the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) adopted Light Rail Transit (LRT) on an alignment between the University of North Carolina (UNC) Hospitals and Alston Avenue in east Durham as the Locally Preferred Alternative (LPA) for inclusion in the 2035 Long Range Transportation Plan (LRTP).
- On April 3, 2012, the Federal Transit Administration (FTA) issued a Notice of Intent to prepare an Environmental Impact Statement (EIS) as required by the National Environmental Policy Act (NEPA) for projects seeking federal funds.

What's new in the last 12 months?

 Triangle Transit and the D-O LRT project staff have:

- Received approval from the Federal Transit Administration (FTA) to enter the Project Development (PD) phase. During the PD phase, Triangle Transit and local decision-makers must (1) Select a locally preferred alternative, and have it adopted into a Long Range Transportation Plan, (2) complete the Environmental Review process, and (3) develop measures to be rated by the FTA.
- Initiated air quality, water resources, traffic, historical inventory, noise, and community impact studies, soil sampling, and many other studies for inclusion in the DEIS.
- Produced engineering for the alignment, alignment and station alternatives, and five Rail Operations and Maintenance Facility alternatives so that a preferred alternative may be selected.
- Prepared station area plans for each of the proposed stations.
- Held more than 200 small group and public meetings and met with more than 3500 members of the public.

We need your help!

 Triangle Transit seeks public input on five Key Decisions:

- (1) Build the Durham-Orange Light Rail Transit Project or Not ("No Build")?
- (2) Selection of the Little Creek Alignment
- (3) Selection of the New Hope Creek Alignment
- (4) Selection of the Station Location for Duke/VA Medical Centers
- (5) Selection of the Rail Operations and Maintenance Facility location

Project decision-makers will consider public input along with environmental study results, costs, development potential, and other factors when making project recommendations.

Next steps on Page 4

Este boletín está disponible en español.
Llámenos a 800-816-7817

Durham-Orange Light Rail Transit Project

>> What is Light Rail Transit?

- Light rail transit (LRT) operates in more than 20 urban areas in the United States and Canada, including: Charlotte, Portland, Baltimore, St. Louis, Buffalo, Dallas, San Diego, Los Angeles, Minneapolis, and San Jose.
- LRT travels on a fixed-guideway, primarily along exclusive rights of way and uses electric rail cars, operated with single cars or in short trains of up to four cars. LRT uses overhead catenary wires as the power source.
- Rail cars are designed to accommodate persons with mobility limitations and bicycles.
- Station spacing can vary from one-quarter mile to a mile and maximum speeds can reach 55 mph. Stations frequently include passenger amenities such as seating, climate controlled areas, shelter, lighting, park-and-ride lots, and passenger notification messages such as the arrival of the next train.



Pre-Paid Ticketing



Level Boarding



Station Shelter and Passenger Notification



Train Interior

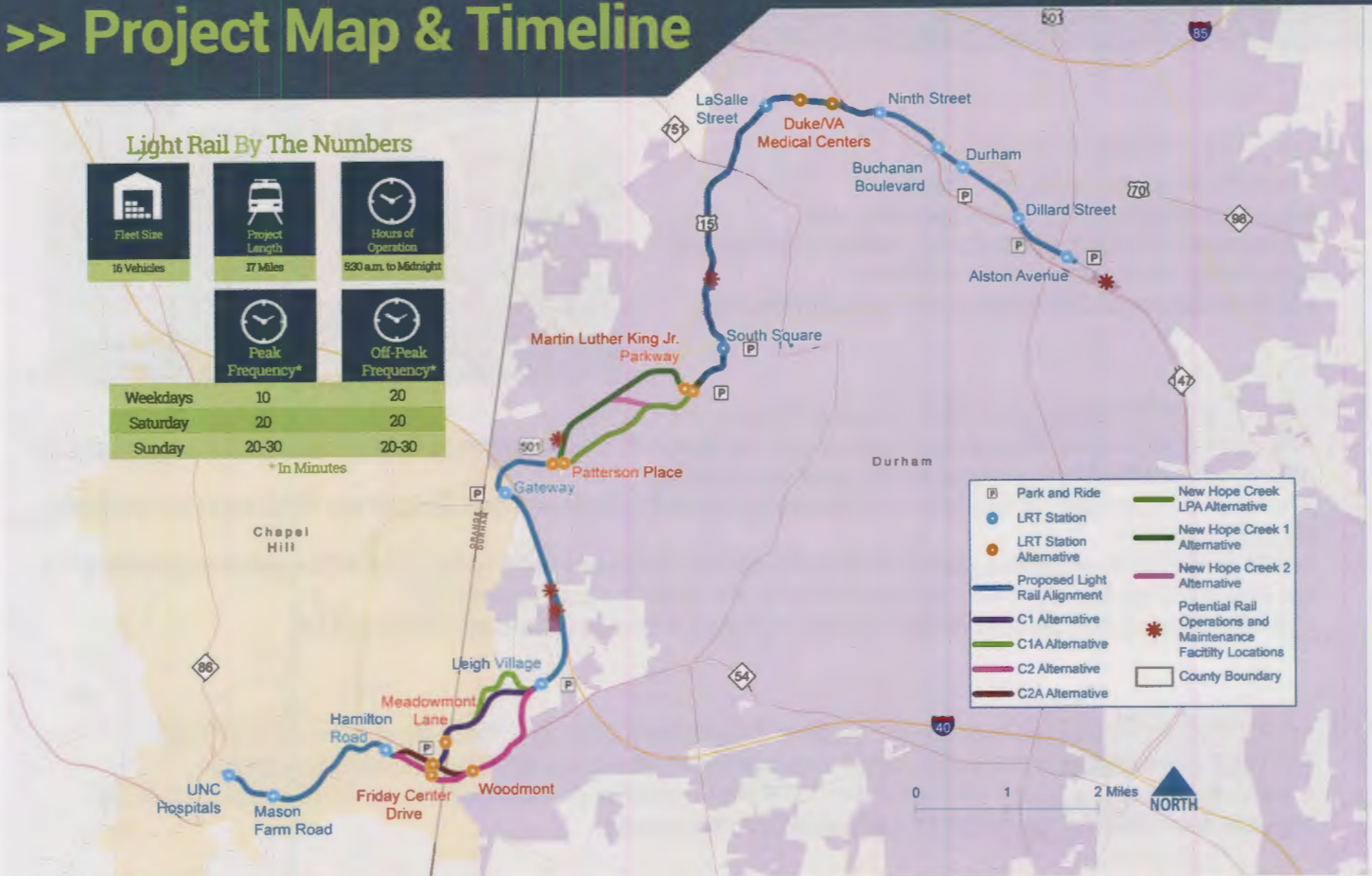
Durham-Orange Light Rail Transit Project

>> Project Map & Timeline

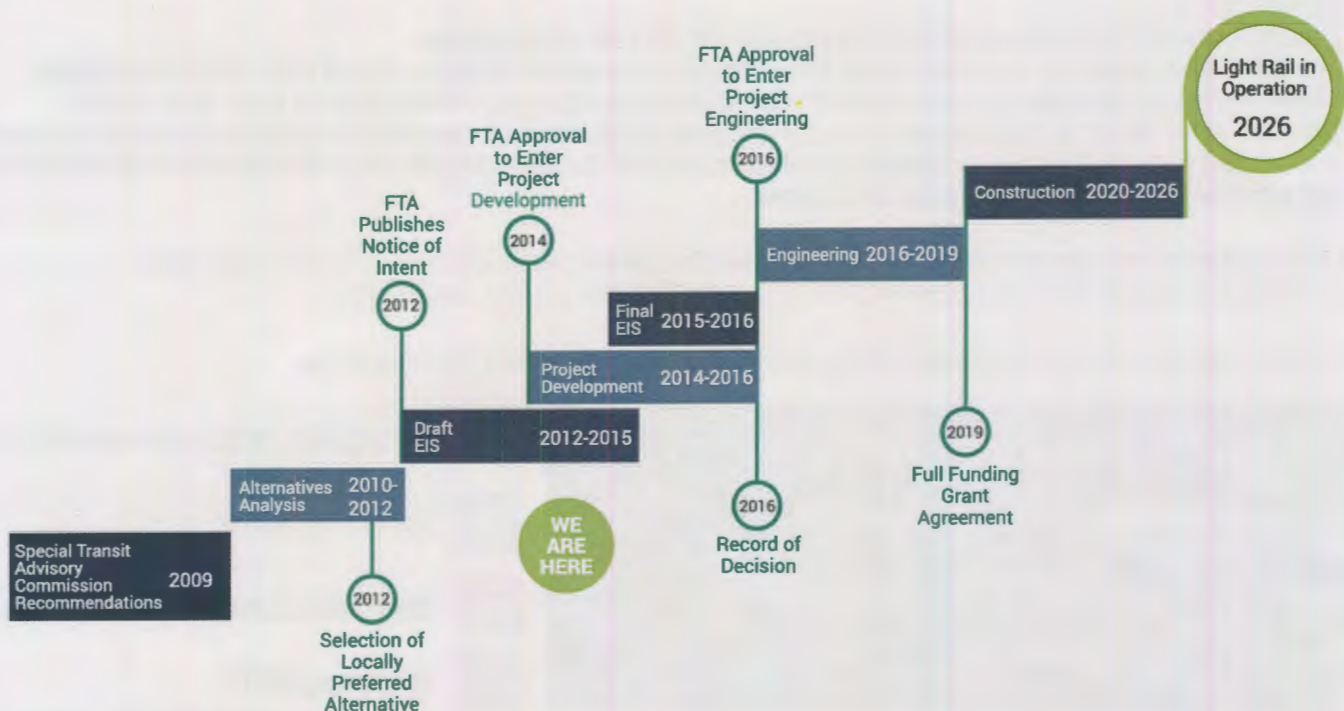
Light Rail By The Numbers

| | | |
|---|---|---|
|  |  |  |
| Fleet Size | Project Length | Hours of Operation |
| 16 Vehicles | 17 Miles | 5:30 a.m. to Midnight |
| |  |  |
| | Peak Frequency* | Off-Peak Frequency* |
| Weekdays | 10 | 20 |
| Saturday | 20 | 20 |
| Sunday | 20-30 | 20-30 |

* In Minutes



Durham-Orange LRT Project Timeline



Durham-Orange Light Rail Transit Project

Attachment C-4

>> Next Steps

November 2014 – Public Open House

- Information about Light Rail Transit, alignment alternatives, Rail Operations and Maintenance Facility alternatives, station alternatives, and station area plans will be available.
- All materials available at www.ourtransitfuture.com



Summer 2015 – Draft Environmental Impact Statement (DEIS)

- The DEIS will disclose all potential partial and full property displacements, relocations, and acquisitions, as well as proposed temporary and permanent easements.
- "Notice of Availability" of the DEIS will be published in the Federal Register and the DEIS will be circulated for public review.
- Public review and comment period is open for 45 days from the publication of the "Notice of Availability" in the Federal Register. Written comments will be accepted by mail and email.
- A public hearing will be held in the corridor during the 45-day public comment period.

Early Spring 2016 – Final Environmental Impact Statement (FEIS) / Record of Decision (ROD)

- The FEIS will address substantive comments received during the DEIS public comment period.
- A Record of Decision (ROD) will state the FTA's final decision, discuss measures to minimize and avoid impacts, and disclose the project's mitigation commitments.

Spring/Summer 2016 – Real Estate Phase

- Property evaluations, appraisals, negotiations, and relocations or acquisitions begin after the ROD is issued by the FTA.
- Federal laws and regulations dictate the process for the real estate phase.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 United States Code Chapter 61) provides for uniform and equitable treatment of persons displaced from their homes, businesses, or farms by federal and federally-assisted programs and establishes uniform and equitable land acquisition policies; federal regulations implementing the Uniform Act (49 Code of Federal Regulations Part 24) establish the process that must be followed.

For more information about the environmental review process, please visit: A Citizen's Guide to the NEPA – Having Your Voice Heard (December 2007) at https://ceq.doe.gov/nepa/Citizens_Guide_Dec07.pdf

Thank you for your continued support of the project and please stay involved!

Stay Involved

Website | www.ourtransitfuture.com

Email | info@ourtransitfuture.com

Phone | (800) 816-7817



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Durham-Orange Light Rail Transit Project

Attachment D-1

>> Fast Facts



Project Development is now underway on the Durham-Orange Light Rail Transit Project

Here are some facts about the planned service:



Length: 17 miles
Planned Stations: 17
Runs between UNC Hospitals in Chapel Hill and Alston Avenue in East Durham



Estimated Travel Time (end to end): 39 minutes
Peak Frequency: 10 minutes
Off-Peak Frequency: 20 minutes



Estimated Cost: \$1.4 Billion (in 2012 dollars) or \$1.8 Billion (accounting for inflation)
Funding Sources: Local 1/2 cent sales tax, vehicle registration fees, rental car tax in Durham and Orange counties, fares, state and federal funds.



Bus Improvements:
New and enhanced bus service will connect to light rail stations.



Project Partners:
Federal Transit Administration, NC Department of Transportation, Durham-Chapel Hill-Carboro Metropolitan Planning Organization, Durham County, Orange County, City of Durham, Town of Chapel Hill.

Light Rail Features



Overhead Electric Power



Bike Racks



Advance Ticketing



Level Boarding



Real-Time Information



Security



Light Rail will operate on tracks separate from freight.

Estimated operating date:
2025/2026

Durham-Orange

Light Rail Transit Project



For more information, visit:
www.ourtransitfuture.com

P.O. Box 530,
Morrisville, NC 27560

Phone:
(800) 816-7817

Email:
info@ourtransitfuture.com

