Amy Harvey

From: CHRIS BLUE
Sent: Thursday, February 29, 2024 2:15 PM
To: Amy Harvey; Sabrina Oliver
Subject: FW: Clark Lake Petition
Attachments: Clark Lake Petition EXHIBIT A - Clark Lake Flooding - 23 04 30.MP4; Clark Lake Petition EXHIBIT B - CH Climate Action and Resp.pdf; Clark Lake Petition EXHIBIT C - NC Statutes - Article_7 - Zoning Regulation.pdf; Clark Lake Petition EXHIBIT D 1 - Ann Rogers CH Town council JUNE 2023.pdf; Clark Lake Petition EXHIBIT D 2 - Ann Rogers Town council comments 9_27_23.pdf; Clark Lake Petition EXHIBIT D 3 - Nolan Cain - Town Council Speech Sept 27, 2023.pdf; Clark Lake Petition EXHIBIT D 4 - Hartley Comments - 2023 09 27 TOCH Council Meeting.pdf; Clark Lake Petition EXHIBIT D 5 - Hartley Input for Planning Commission 5-16-23 and Council 5-24-23.pdf; Clark Lake Petition EXHIBIT E - Charles Berlin Endorsement.pdf; Clark Lake Petition + Signatures - Chapel Hill Town Council - 2024 03 06 - Submitted.pdf

Team: Can you get this shared with Council as soon as you can? Petition that they will hear next week.

Christopher C. Blue
Town Manager
Town of Chapel Hill
405 Martin Luther King Jr Blvd.
Chapel Hill, NC 27514
919 968 2743

From: Anne Hartley <anne@ahconsulting.co>
Sent: Wednesday, February 28, 2024 5:30 PM
To: CHRIS BLUE <CBLUE@townofchapelhill.org>
Subject: Clark Lake Petition

Hi Chris,

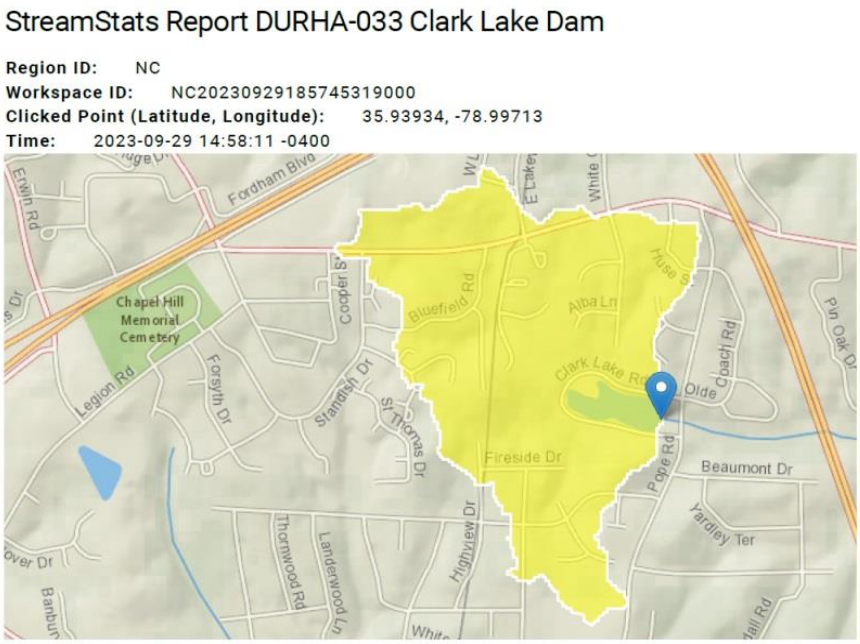
Attached is the petition and attachments (exhibits)to be submitted at the March 6 meeting, Please confirm receipt and that everything is in order.

Thanks,

Anne

PETITION TO CHAPEL HILL TOWN COUNCIL ON 03/06/24

We, the undersigned, submit this petition to the Chapel Hill Town Council (CHTC) to dispute the exclusion of Clark Lake dam evaluation from the Clark Lake Basin Study offered by the developer and accepted by CHTC. Said study along with several other items served as a supplemental provision to the Chapel Hill Crossing Conditional Zoning Application, approved by CHTC on 9/27/23.



Clark Lake Basin

The rationale given to exclude the Clark Lake dam evaluation from the Clark Lake Basin study was that the Town of Chapel Hill (TOCH) does not have purview over a private lake to mandate the inclusion – and that dam safety is solely regulated at the state and federal level by the Department of Environmetal Quality (DEQ). We have confirmed with a DEQ Regional Engineer that dam safety regulations **do not** preclude a third-party *study* of a private dam when the owner gives permission. This clarification removes the obstacle that excluded the dam evaluation follow through from the Clark Lake Basin Study.

Both the CHTC (as evidenced with comments on the recording of the meeting) and those in attendance expected the study to include an evaluation of the Clark Lake dam so that everyone could understand more exactly its state in order to inform the ongoing design and permitting process safety — and long term lake/dam viability.

We propose two viable remedies:

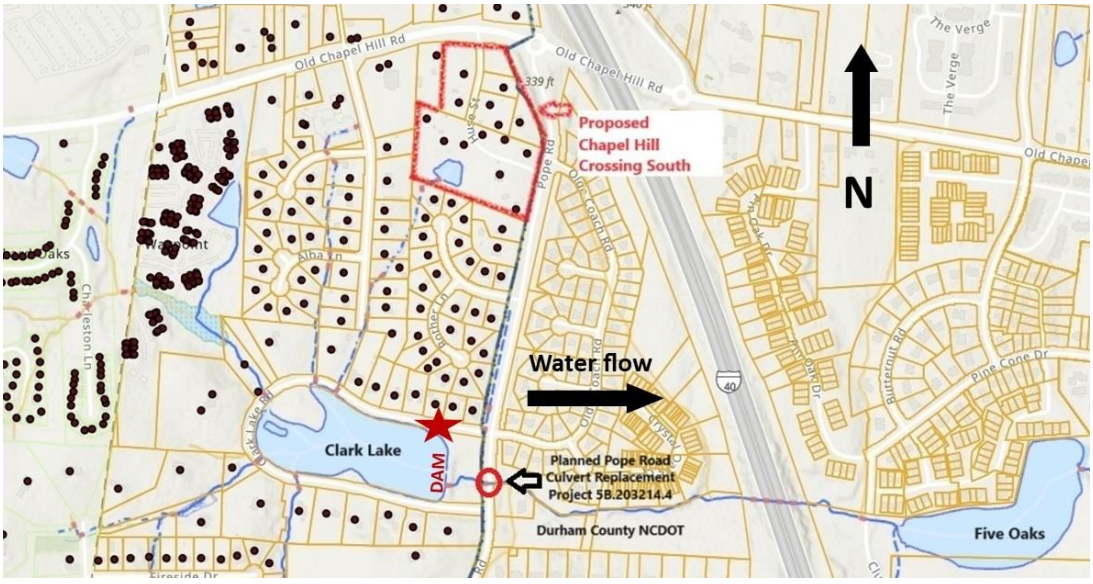
- **Modify the ordinance to include the Clark Lake dam study, as agreed on 9/27/23**
- **Decouple Chapel Hill Crossing <u>South</u> from the application and rescind its approval.**

PETITION TO CHAPEL HILL TOWN COUNCIL ON 03/06/24

Background Summary

On 9/27/23 the Chapel Hill Crossing Rezoning Application was approved to rezone property from R-1 to R-6 which would to allow construction of up to 135 housing units, thus replacing the 14 single-family homes that already exist and replace several acres of soil that currently absorbs rain water with impervious surface area. The Clark Lake neighborhood — a neighborhood of about 18 houses and a 6.5 acre lake that was originally constructed as a farm pond — is positioned about a third of a mile downhill from Chapel Hill Crossing and will be subject to all the stormwater run-off produced by the new Chapel Hill Crossing Development.

Over the past ten years, residents have already noticed the increased flooding with more torrential rain storms occurring and as more TOCH construction has been built uptream with subsequent runoff into the lake through streams and residential properties that are also experiencing extreme flooding. While climate change may or may not be a contributing factor to the increased flooding we have observed, we must be cognizant that we will ultimately be faced with that impact which will also contribute to increased rainfall and even more flooding and stress on the lake and dam. See Exhibit A - a video from a 2023 flooding episode.



Annotated TOCH Interactive Density Map of the Area

PETITION TO CHAPEL HILL TOWN COUNCIL ON 03/06/24

The above map delineates the area inside the north-east corridor of TOCH limits within Durham County – bounded by Pope Road on the east through annexation in 1986 when the area was originally rural Durham County. There has been significant TOCH residential development as well as new development on the east side of Pope Road. Neighboring communitues are Stratford Glen (TOCH), Colony Woods (TOCH), White Oak (TOCH), and Pope's Crossing (downstream - Durham Municipal).

Along with other concerned citizens in nearby neighboorhoods, the Clark Lake neighborhood unsuccesfully contested the Chapel Hill Crossing application, citing stormwater runoff from construction sites and upstream TOCH communities impacting both the lake and residental lots. Residential lot flooding in Stratford Glen, adjacent to the proposed Chapel Hill Crossing site, was also pointed out on several occasions.

Since the 1986 annexation by TOCH, Clark Lake (originally constructed as a farm pond) has served as an informal stormwater reservoir for the TOCH without any upgrades for that purpose. Understanding the integrity of the dam is of vital importance to the TOCH as well as the owners of Clark Lake, and surrounding neighborhoods – both upstream and downstream.

On 9/27/23, CHTC decided to approve the Chapel Hill Crossing Conditional Zoning application, in conjunction with several supplemental provisions.

One of the agreed-to supplemental provisions of the Chapel Hill Crossing Conditional Zoning application was for the developer of the property to conduct a larger stormwater study named the Clark Lake Basin Study. Both the CHTC (as evidenced with comments on the recording of the meeting) and those in attendance expected the study to include an evaluation of the Clark Lake dam so that everyone could understand more exactly its state in order to inform the ongoing design and permitting process safety.

The resulting revision to Ordinance A to capture this agreement reads as follows:

> **13. Clark Lake Basin Study: Delineate and analyze the entire drainage basin contributing to Clark Lake for peak flow as the existing condition and then with the post-development configuration of the Chapel Hill Crossings Huse Street construction. Completed analysis shall be provided to Town Manager prior to final zoning inspection of any phase of the Huse Street site.**

Unfortunately, this revision is insufficient as it does not include a study of the Clark Lake dam itself. The CHTC felt that it did not have the purview to mandate the study follow-through or for the developer to perform the Clark Lake dam evaluation study. It has now been clarified by a DEQ Regional Engineer that regulations do not preclude a third party from conducting a study for a private dam with the permission of the owners.

Why The Study Was Offered and Accepted

The Clark Lake Basin study was offered by the developer and accepted by the CHTC in response to the significant concerns raised by citizens from the Clark Lake and nearby communities (representative comments are attached as Exhibits D & E). These concerns encompassed stormwater runoff, Clark Lake flooding, residential lot flooding, and the integrity of the Clark Lake dam and what its breaking point might be. Concerns were also raised about using obsolete NOAA and FEMA climate data in stormwater runoff analysis. CHTC "heard" and reiterated the concerns. Several council members visited the location and met with community liaisons one-on-one.

As of 2015, state-maintained Dam Safety Inspection data shows the Hazard Potential Classification for Clark Lake Dam as "Intermediate – Class B" which is defined as follows in the NC Statute – and resulted in Clark Lake being exempted from an Emergncy Action Plan (EAP):

> Class B includes dams located where failure may damage highways or secondary railroads, cause interruption of use or service of public utilities, cause minor damage to isolated homes, or cause minor damage to commercial and industrial buildings. Damage to these structures will be considered minor only when they are located in back water areas not subjected to the direct path of the breach flood wave;* and they will experience no more than 1.5 feet of flood rise due to breaching above the lowest ground elevation adjacent to the outside foundation walls or no more

than 1.5 feet of flood rise due to breaching above the lowest floor elevation of the structure, the lower of the two elevations governing. All other damage potential will be considered serious.

* Downstream flooding from Clark Lake would be in the direct path of the breach.

However, part of the preliminary work that was done when the EAP was first required – before the exemption – produced a Simple Inundation Map which was rejected by DEQ because of this reason stated in communication Clark Lake received from the engineering firm who completed the simple map:

> *A State Dam Safety Engineer at NC DEQ informed [engineering firm] that it would not be possible to create a Simplified Inundation Map for the Clark Dam due to the cascading nature of the dam and the major highway downstream. This means that if the Clark Lake dam were to fail, it could potentially overtop the highway or trigger the failure of a downstream dam. Due to the populated areas downstream and potential for cascading failure of the dams, a dam breach computer model that takes into account the cascading nature of the breach and the highway would need to be created.*

As Clark Lake was ultimately exempted from the requirement to create an EAP in 2015 due to its 'Intermediate' potential hazard classification, a more extensive inundation plan was shelved.

Since 9/28/23 – The Day After The Approval

The official updated ordinance language that excluded mention of the Clark Lake dam was published on 11/20/2023. Anne Hartley, the Clark Lake community's representative, had maintained close contact with TOCH since the day after the September 2023 vote, and had asked how Clark Lake could engage with the Clark Lake Basin Study.

Ms. Hartley was guided by the Mayor's office to first meet with Loryn Clark, Deputy Town Manager. Shay Stevens, Community Relations Manager, was also involved. There was one face-to-face meeting on 11/1/23 at Town Hall and subsequent email follow-ups while the ordinance was being written, where Ms. Hartley raised our concerns to make sure that the dam integrity evaluation would be included.

Ms. Hartley also shared information about City of Raleigh's stormwater management program that reflects a partnership between the city and private lake owners when development may impact private lakes, creating a potential public safety matter.

In addition to the TOCH outreach, Ms. Hartley contacted the developer (Ernie Brown) about the study and he requested a proposal which she provided. The scope and approach of the proposal she provided included both the stormwater analysis and dam integrity studies. While the initial conversations did not reveal any indication that the dam evaluation would not be included, Mr. Brown ultimately informed Ms. Hartley via email that the scope and approch of the study was defined to be the language that ended up in the ordinance – no mention of the dam.

Upon receipt of the official ordinance confirming the dam was not mentioned, with the help of Jeanne Brown, Chief of Staff for the Mayor, Ms. Hartley brought this omission to the attention of both outgoing and incoming Mayors (Hemminger and Anderson), expecting that the CHTC would stand by their expectation that the dam study would be included. She was told the mayors discussed the study with the Town Manager and that the Stormwater Group was assigned responsibility to finalize the scope with the developer.

On 1/22/24, Ms. Hartley was informed by Jeanne Brown via email as follows:

> In response to your questions about the Clark Lake Basin Study, I am writing to provide answers to 1) the scope of the basin study; and 2) the role the Town plays with respect to privately owned dams.
>
> *First, because the Town does not have purview over the safety of privately owned dams, the study will not include an evaluation of the integrity of the dam. Instead, this is a matter that falls under the auspices of the North Carolina Dam Safety Program<https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/dam-safety> which provides certification and inspections of publicly and privately owned dams across the state. The program can, also, provide information about potential grants for certain types of projects. If Clark Lake residents have not already done so, we encourage you to reach out to their district office for assistance.*

> Second, we appreciate your providing examples of how other communities, like Raleigh, evaluate private ponds and lakes as part of their comprehensive stormwater management plans. At present, the Town is in the process of gathering environmental information for consideration as we update our stormwater policies and rewrite our Land Use Management Ordinance. <https://www.townofchapelhill.org/government/departments-services/planning/plans-and-ordinances/lumo-land-use-management-ordinance>

Unfortunately the above communication appears to be unresponsive to the fundamental issue, which is simply whether the town will hold the developer to what CHTC and the affected public believed the developer was promising as a supplemental provision with approval, namely that the developer (not the town nor Clark Lake owner) would be doing a study to include the dam integrity, as it relates to water runoff safety as a consequence of this major development in an area already compounded by increased flooding exacerbating impacts from existing TOCH neighborhood runoff.

Detailed Grounds for Contesting

The insufficient scope and expectation of the Clark Lake Basin study are being contested on these grounds. This list is comprehensive and will repeat points covered above with more detail:

1. CHTC members as well as citizens and stakeholders in attendance clearly understood the context of "a study of the *entire* Clark Lake basin" was to include the Clark Lake dam integrity. The meeting recording has Council members' comments before their vote that support this reiterating the importance of said study to include the Clark Lake dam. Comments also included specific mention of including neighborhood stakeholders. Link to the meeting video: https://chapelhill.granicus.com/player/clip/6667?view_id=7&redirect=true&h=09468ce5b3ed44fefbe2730ac7d817c3 Excerpts from comments that begin around 3:20:

Developer representative remarks:

Jewel: "concerned about stormwater runoff…we've known that from day one. We are very sympathetic to the people that live around Clark Lake… We know that downstream neighbors are concerned about runoff going through their property increasing and causing damage… As a reminder, controlling the 100-year storm is meant to limit the runoff coming from the site… That said, folks are concerned about the effect, the big picture, what they need to deal with in the future as a community.

Jewel: "Mr. Brown is committing to fund a study of the entire [Clark Lake] basin that would look at where the problems may be, where they might be substandard"... which could only refer to the dam.

Council members' remarks:

Ryan: "We need to think about downstream [consequences]," and it's important to continue to further "speak to the neighbors"

Parker: "I hope the study will come up with actionable recommendations."

Miller-Foushee: "the dam is a challenge...I appreciate the developer is willing to look at that...It shows good faith to the neighbors."

Stegman: "more communication is needed with the neighbors, [by] your storm water [study] person.

Mayor: "We've heard the neighbors' concerns, you have a right to be concerned...[re the study] we need to know what's going on..."

It seems very clear that the CHTC's understanding was that the Clark Lake dam evaluation would be a part - in fact the crucial part - of the study.

2. The Department of Environmental Quality (DEQ) that regulates dam safety for private dams has confirmed that the dam safety regulations **do not** preclude studies being performed by third parties with owner's permission: "*there is*

nothing that prevents the owner from allowing or performing an investigation or study like that. The permitting aspects of the law have more to do with work (construction/repair/modification/removal) being done on the dam and approval of emergency action plans." – as stated in email communication received on 1/25/24 from an engineer within the Division of Energy, Mineral, and Land Resources, the division within DEQ that regulates dam safety for private dams.

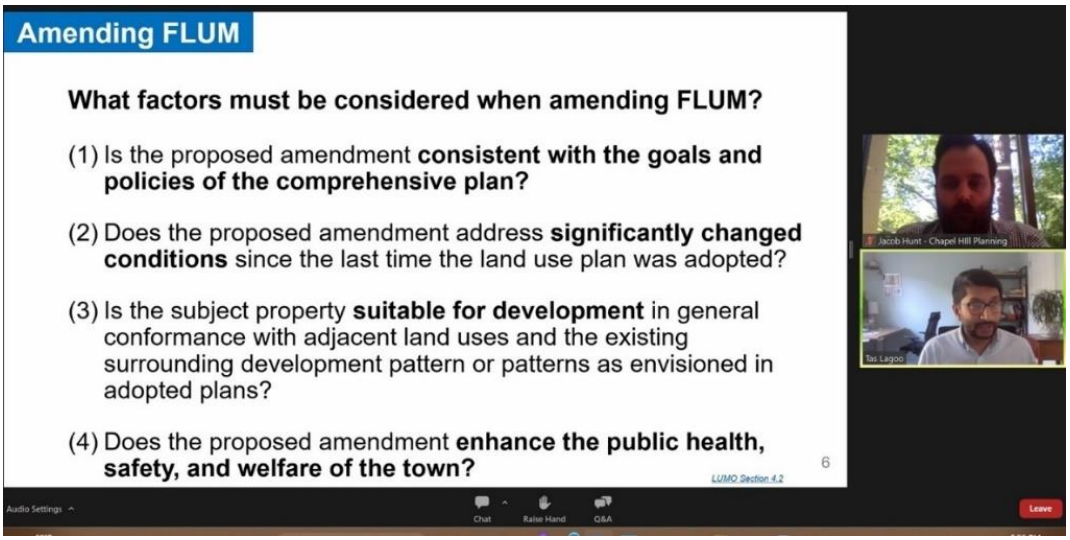
3. While Clark Lake is privately owned, TOCH has a vested interest in its continued existence and is responsible for the impacts of the decisions the TOCH/CHTC makes with respect to public safety and wellbeing of neighborhoods.
4. Clark Lake serves the TOCH in an informal stormwater management capacity at no cost to the TOCH. The runoff coming into Clark Lake is from TOCH communities. What would the impact be to the TOCH if the Clark Lake/Dam were removed by the owners because remediation cost for dam safety were simply out of reach?
5. Clark Lake owners are not causing any of the changes that are impacting the lake and dam yet seem to be expected to shoulder the burden of consequences and impact to the dam. While we understand ownership accountability of private dams, it is reasonable that responsibility for the dam should be approached as a partnership with the TOCH stepping in for its share since it is directly contributing to the increased flooding as a result of approving new development that increase number of residential or business units and replaces pervious surface with impervious.
6. We have also learned that private responsibility also does not preclude a third party such as the TOCH from contributing to dam remediation efforts for a private lake when the lake and dam are of strategic importance to the town and a matter of public safety. The City Of Raleigh has had in place for 20 years a Lake Evaluation Policy that defines how it includes private lakes in its comprehensive stormwater manage plan including funding support remediation: https://cityofraleigh0drupal.blob.core.usgovcloudapi.net/drupal-prod/COR16/LakeManagementEvaluationPolicy.pdf

7. Concerns about added stress from TOCH decision-making to Clark Lake dam was a dominant theme throughout all public hearings from the Chapel Hill Crossing development as well as 1-1 meetings with CHTC members. There is already extreme, frequent flooding happening and runoff from upstream TOCH neighborhoods. The concerns raised by the Clark Lake community and the seriousness were clearly understood.
8. If Clark Lake were to breach and flood downstream properties it could be catastrophic with cascading effects – including impacting nearby I-40 that might serve as the new containment area. This assessment is based on the current Potential Hazard classification as 'Intermediate – Class B' that was assigned in 2015. Refer to Class B Hazard defintion on page 4 of this petition.

   A Simple Inundation Map was created in 2015 as part of preliminary EAP work, but was rejected by DEQ because of the cascading nature of the dam and the major highway downstream. Refer to page 5 of this petition for detail of the rejection as being insufficient and the potential risk.

   As Clark Lake was ultimately exempted from the requirement to create an EAP in 2015 due to its 'Intermediate' potential hazard classification, a more extensive inundation map was shelved.
9. Concerns were also raised about the outdated NOAA and FEMA data used in the stormwater studies instead of current data that reflects climate change will results in grossly understated calculations. It was reasonable to expect that given the focus on the outdated data, the Clark Lake study should commit to using current data for the most accurate outcomes.
10. Clark Lake residents raised major flags about flooding that is already extreme – impacting residences as well as the lake/dam. Many of the points raised are mentioned in the **Chapel Hill Climate Action and Response Plan** (Exhibit B). There are seventeen (17) mentions of stormwater management's role in the plan. Plus community engagement and resilience, early warnings, and partnerships as part of response plans.

11. Approving the Chapel Hill Crossing Conditional Zoning application without first updating the **Future Land Use Map** which defines the area as R-1 is in essence a rezoning decision to rezone property fron R-1 to R-6. There are state and local laws for reasonableness, public safety, and wellbeing that apply. The proper process and consideration for amending the FLUM was abandoned which is legal. However the underlying rezoning considerations still apply for which the TOCH is accountable. This following screenshot is from a virtual neighborhood informational meeting hosted by the TOCH Planning Department:



NC Statute Article 7 Zoning Regulations are attached as Exhibit C. The opening paragraph of Article 7 Zoning Regulations reads:

Zoning regulations shall be made in accordance with a comprehensive plan and shall be designed to promote the public health, safety, and general welfare. To that end, the regulations may address, among other things, the following public purposes: to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; to lessen congestion in the streets; to secure safety from fire, panic, and dangers; to facilitate the efficient and adequate provision of transportation, water, sewerage, schools, parks, and other public requirements; and to promote the health, safety, morals, or general welfare of the community.

Conclusion

To clarify, the Clark Lake dam is not currently "failing", and the lake is not "putrefying" - terms used by Dan Jewel during his comments to CHTC about Clark Lake concerns leading up to the offer for the study. The lake's water quality is well maintained. Manageable repairs to the dam and downspout have also occurred over the years.

That said, the lake, dam, and some residential properties are being notably stressed by increase in extreme flooding over the past 10 years and runoff from nearby TOCH neighborhoods because so much impervious surface has replaced soil that used to absorb the water. The spillway is used on a regular basis causing erosion that will eventually need to be addressed.

Clark Lake owners have sounded a proactive alarm and also understand their responsibility for dam safety remediation but do not accept they should bear the full burden of decisions and lake impacts beyond their control. If the results of the study come back with a remediation price point that is simply not viable for the owners, the only option may be to remove the lake. How would this impact TOCH?

It would seem that the TOCH has a vested interest in understanding the integrity of the Clark Lake dam because it could well be faced with a decision in the future about whether maintaining Clark Lake as a stormwater runoff reservoir is important.

Turning a blind eye to any shared role with Clark Lake owners is ill-advised and not reflective of responsible town governance.

This is an opportunity for both the TOCH and the developer to join together in partnership with the community on such a critically import issue that is of mutual interest and benefit. This is also an opportunity to establish a respectful relationship built on good will and for the developer to demonstrate his claim to being a good neighbor.

We respectfully propose this revised ordinance as follows (addition in blue):

> 13. Clark Lake Basin Study: Delineate and analyze the entire drainage basin contributing to Clark Lake for peak flow as the existing condition and then with the post-development configuration of the Chapel Hill Crossings Huse Street

construction. Completed analysis shall be provided to Town Manager prior to final zoning inspection of any phase of the Huse Street site. Perform a Clark Lake dam Integrity Study that is contingent on the owners of Clark Lake permitting access to the property for the study with Clark Lake owner representation engaged as stakeholder. The study shall use current climate data.

Alternatively, decouple Chapel Hill Crossing South from the application and rescind its approval because a stipulation that was agreed to as part of the approval will not be met. Revert to R-1 development regulations for the South section.

We have clarified with DEQ that dam safety regulations do not preclude a third party from funding and conducting a study of the Clark Lake dam with the permission of the owner — paving the way for the dam evaluation to be added back.

Pointing to a 100-year flood regulation and documenting before and after stormwater runoff for the basin does nothing to address the concerns about impacts to the dam and the importance of understanding dam integrity that you, the CHTC, counted on with your vote to approve.

We submit that the TOCH has every right and responsibiity to mandate the developer's accountability for follow through of the Clark Lake dam evaluation study. On that note, we ask the CHTC to reengage with the developer to ensure the dam evaluation is added back and that Clark Lake representation is appropriately added to the study team as a stakeholder.

We — the TOCH, Clark Lake, and developer of Chapel Hill Crossing — all need to understand what conditions could cause the Clark Lake dam to fail and then work together to prevent that from happening. This should be approached in partnership.

Signature Pages Follow

Email Attachments

Exhibit A	**Clark Lake Flooding Video**
Exhibit B	**Chapel Hill Climate Action and Response Plan**
Exhibit C	**NC Statute Article 7 Zoning Regulation**
Exhibit D	**Representative Comments from Public Hearing**
Exhibit E	**Petition Endorsement from Charles Berlin**

PETITION TO CHAPEL HILL TOWN COUNCIL ON 03/06/24

	Name and Address	Neighborhood	Signature
1 2	Joanna and Seth Pomerantz 420 Clark Lake Rd. Durham, NC 27707	Clark Lake	
3	TED BROOKS, DDS 109 CLARK LAKE RD DURHAM, NC	CLARK LAKE	
4	CHARLES BERLIN 222 BLUEBIRD RD. CHAPEL HILL, NC 27517	PICKARD OAKS	
5 6	Adam + Kathleen Vane 112 Rother Ln Durham, NC 27707	Stratford Gln	
7 8	Ann and Dan Huff 114 Rother Lane Durham, NC 27707	Stratford Glen	
9	Laura Caruso 428 Clark Lake Rd. Durham, NC 27707	Clark Lake	
10 11	Mr + Mrs. Glatz 107 Rother La. Durham NC 27707	Stratford Glen	
12	Susan Rice 4117 Olde Coach Rd Durham, NC 27707	Pope's Crossing	
13	Nu-Yen Hung 4107 olde Coach Rd Durham, NC 27707	Pope's crossing	
14 15	Meg and Marty Pomerantz 4/Co Clark Lake Rd. Durham, NC	Clark Lake	

PETITION TO CHAPEL HILL TOWN COUNCIL ON 03/06/24

	Name and Address	Neighborhood	Signature
16 17	TOMMY FONDREN and MARY SNYDER 322 Clark Lake Rd DURHAM, NC 27707	CLARK LAKE	Mary C. Snyder Thomas J Fondren
18	David Fondren 322 Clark Lake Rd Durham, NC 27707	Clark Lake	David J. Fondren
19	Debbie Baker 108 Cricket Ground Durham NC 27707	Stratford Glen	Debrah Baker
20 21	Charles Keith & Maki Fairchild 406 Clark Lake Rd Durham, NC 27704	Clark Lake	Charles Keith Maki W. Fairchild
22 23	Jane Walters Mark Walters 103 Cricket Ground Durham, NC 27707	Stratford Glen	Jane M Walters Mark D Walters
24	Ann Rogers 306 Clark Lake Rd Durham NC 27707	Clark Lake	Ann B Rogers
25	Elizabeth B. Epperson 118 Clark Lake Rd Durham NC 27704	Clark Lake	Elizabeth B. Epperson
26	Marian Rieth 210 White Oak Rd Durham, NC 27707	White Oak	Marian C Rieth
27 28	Elizabeth + Ellen Stevens 122 Clark Lake Rd. Durham, NC 27707	Clark Lake	
29	DOTTIE FIDDLEMAN 1106 CRICKET GR DURHAM, NC 27707	STRATFORD GLEN	D. Fiddleman

PETITION TO CHAPEL HILL TOWN COUNCIL ON 03/06/24

	Name and Address	Neighborhood	Signature
30	Kristine LITTLE 101 Candlelight Ct. Durham NC 27707	Knollwood	
31	Nolan Cain 208 Clark Lake Rd Durham, NC 27707	Clark Lake	
32	Brian & Ann 109 Rotler Ln Durham NC 27707	Stanford Glen	
33	Doug Halverson + Emily Kiser 110 Alba Lane Durham NC 27707	White Oak	
34	El Fisseha 701 Emory Dr Chapel Hill, NC 27517	Clark Lake	
35	Tekola Fisseha 204 Clark Lake Rd. Durham, N.C. 27707	Clark Lake Rd.	
36 37	Robin Segall / Sid White 105 Alba Lane Durham, NC 27707	White Oak	
38	Linda Convissor 207 White Oak Durham, NC 27707	White Oak	
39 40	Max Ginnis Jeannie Ginnis 214 Clark Lake Rd Durham, NC 27707	Clark Lake	
41 42	ANNE+ AL HARTLEY 104 CLARK LAKE RD DURHAM, NC 27707	CLARK LAKE	






2021

Town of Chapel Hill Climate Action and Response Plan

Acknowledgments

TOWN LEADERSHIP

Town Manager

Maurice Jones

Mayor Pam Hemminger

Mayor Pro Tem Michael Parker

Council Members

Jessica Anderson

Allen Buansi

Hongbin Gu

Tai Huynh

Amy Ryan

Karen Stegman

TOWN ADVISORY BOARDS & COMMISSIONS

Community Design Commission

Environmental Stewardship Advisory Board

Housing Advisory Board

Human Services Advisory Board

Justice in Action Committee

Parks, Greenways, and Recreation Commission

Planning Commission

Stormwater Management Utility Advisory Board

Transportation and Connectivity Advisory Board

ORGANIZATIONS

Bicycle Alliance of Chapel Hill
Boys and Girls Club of Chapel Hill
Citizens Climate Lobby
Chapel Hill Rotary Club
Clean Air Carolina
Climate Action NC
Climate Action Coalition of Orange County
Dominion Energy
Duke Energy
El Futuro
Habitat for Humanity
oundation
Hope Renovations
Inter-Faith Council
NAACP – Environmental Justice Task Force
NC DEQ
NC Sierra Club
Orange County Sustainability
Orange County Climate Council
Orange County Commission for the Environment
Orange County Health Department
Orange County Living Wage
Orange County Solid Waste
OWASA
Piedmont Electric Membership Corporation
PORCH
Rogers Road Community Center
Southeast Regional Climate
Sunrise Movement
The Conservation Fund
Town of Carrboro
Town of Hillsborough
The Nature Conservancy
Triangle Community Foundation
UNC – Chapel Hill
UNC – Coastal Resilience Center
UNC – Institute for the Environment
UNC – Undergraduate Student Government

CLIMATE ACTION TEAM MEMBERS

Dave Almond
Sammy Bauer
Vencelin Harris
Becky McDonnell
Mary Jane Nirdlinger
John Richardson
Alisa Duffey Rogers
Laura Selmer
Wendy Simmons
Shakera Vaughan

SPECIAL THANKS TO

Loryn Clark
Brian Litchfield
Melanie Miller
Sarah Viñas
Bergen Waterson

CHAPEL HILL COMMUNITY

Thanks to the Chapel Hill community for your insight and support of the Chapel Hill Climate Action Plan and making Chapel Hill a stronger and more resilient community

TAKING ACTION TOGETHER SUMMIT COMMUNITY PARTNERS

A special thanks to our Community Partners—the businesses, development community, educational, finance, local, state and federal, agencies; neighborhood, environmental, and social justice organizations—who participated in the "Taking Action Together Summit."

CONSULTANT TEAM

Planning Communities

KLA

Contents

Message from Leadership

The future of Chapel Hill belongs to the young people of this community, and we have a responsibility to do all that we can to leave this place better than we found it. We also have limited time to avoid the worst of climate change, so our collective actions must be bold, swift, and connected. This plan puts us on a path to address the greatest challenge of our time, and we will be a leader in this effort.

Climate action strikes a balance between **reducing** the greenhouse gas emissions that cause climate change and **adapting** to the impacts that come from a changing climate. To do this, we will use both new technologies and old, harnessing innovation as well as the strength and wisdom of our natural environment.

Our work will uphold **environmental justice** by actively addressing environmental racism. We must embrace our ugly truths and have respect for all when we act. This means we will listen more than we speak. We will ask **all residents** what they need. We will make decisions together, and we will **empower** our entire community.

Our actions will be in partnership with other Orange County communities, those within the greater Triangle area, as well as our peers across the state and the region. We will focus on working relationships that help us maximize our climate goals and generate other benefits like new **jobs**, more **affordable housing**, and greater **protections** to our residents — particularly those who are most at risk to the impacts of climate change.

Our changing climate is a significant threat yet many of the solutions we will consider offer us an opportunity to affirmatively address other societal ills. This plan is a vehicle for helping Chapel Hill truly become a community where everyone feels safe and financially secure, with access to affordable housing, clean air and water, and healthy foods.

Let's get going.

—Chapel Hill Town Council

Town of Chapel Hill Climate Action and Response Plan

The Town of Chapel Hill's community goals include creating a vibrant and inclusive community while being conscious of environmental justice and stewardship. Reaching these goals means that the Town must prepare the community for the future by advancing racial equity and creating resiliency and sustainability.

Since 2006, when it committed to reduce its own carbon dioxide emissions by 2050, the Town of Chapel Hill has maintained its strong commitment to reducing its contribution to climate change. The Town is also committed to improving community resilience to better prepare for the effects of ongoing climate change.

In September 2019, the Town Council passed a resolution to create a Climate Action and Response Plan and to put the Town on a path to 100% renewable energy by 2050. This Climate Action and Response Plan describes climate goals, challenges and opportunities, as well as the highest impact actions the Town and community can begin to take over the next five years to lower carbon emissions and address the effects of climate change. The four main action categories within the plan are:

- Buildings and Energy
- Transportation and Land Use
- Waste, Water and Natural Resources
- Resiliency

These categories are part of a system that connects to everything we do and experience in Chapel Hill. Within each category, there are a series of specific actions and strategies designed to help us reach our goals of being an equitable, resilient, clean energy community by 2050. To take advantage of new solutions and opportunities, we will update this plan every five years beginning in 2025. Each cycle, our approach will be to learn, act, measure, and adapt – making changes whenever they are needed.

Climate Change and Extreme Weather

Climate change refers to long-term changes to weather patterns, such as a place becoming generally hotter, colder, drier, or wetter over time. In recent decades, climate change has occurred at an unprecedented rate primarily due to greenhouse gas emissions from human activity. This human impact on the environment is evident in the increasingly unpredictable and destructive weather patterns that negatively affect our community. **This Climate Action and Response Plan will help our community face these climate changes and challenges.**

WHAT ARE GREENHOUSE GASES?

Greenhouse gases (GHGs) are gases in the earth's atmosphere that trap heat and warm the planet. GHGs include carbon dioxide, methane, nitrous oxide, and fluorinated gases. The right proportion of GHGs keep our planet warm enough to support life. When there are too many GHGs in our atmosphere, too much heat is trapped and overall temperature rises.

Human activity such as burning fossil fuels has caused a dramatic increase in these gases since around 1900, and the trend has rapidly accelerated in recent years.

HISTORIC WEATHER TRENDS FOR NORTH CAROLINA

Temperature

2009-2018 warmest 10-year period on record for NC

2019 warmest year on record for NC

2010-2018 had the greatest number of nights >75° on record for NC

Winter temperatures above average since 1990 (30 years)

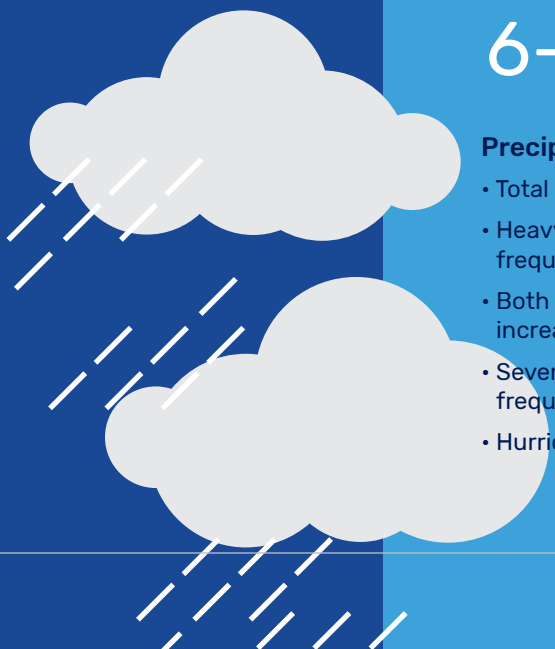
Precipitation and Storms

2020 was the second wettest year on record in North Carolina

2015-2018 had the greatest number of heavy rain events (days with 3 inches or more) since 1900.

2018 - Hurricane Florence - 20-36 inches of rain in the most intense rainfall event on record

2016 - Hurricane Matthew - 10-18 inches of rain over 3 days



PROJECTED CHANGES IN REGIONAL TEMPERATURES AND PRECIPITATION BY 2050

Temperature Increase

2-5°F (NC)

Increase in the Number of Days >95°

15-25 or more days per year (Piedmont Region)

Increase in the Number of Nights >75°

6-35 or more days per year (Piedmont Region)

Precipitation and Storms

- Total annual precipitation will increase
- Heavy rain events will become more frequent and more intense
- Both coastal and inland flooding will increase
- Severe thunderstorms will become more frequent
- Hurricanes will be more intense and wetter

High-Impact Actions ★

Top 5 Action Categories

The following is a list of the top action categories to reduce our community carbon footprint by 2050 and build resiliency. These measures are projected to reduce emissions by approximately 62% below projected 2050 levels. In cooperation with UNC's carbon reduction plans, the total reduction in community emissions would be nearly 83% below 2005 levels. Within our authority to act, we are focused on the most impactful actions we can take today, while also continuing to plan for the remaining 17% of emissions as we update this strategy every 5 years. Our new long-term goal is to produce zero net emissions by 2050. Specific actions are highlighted below and detailed later in the plan, where a ★ indicates that an action is a high-impact priority between now and 2025.

1. Green the grid ▼30-31%

ACTIONS

- Advocacy
- Large- and small-scale renewable energy projects

TARGETS

- Utilities: net zero emissions by 2050

2. Sustainable transportation ▼ 12-13%

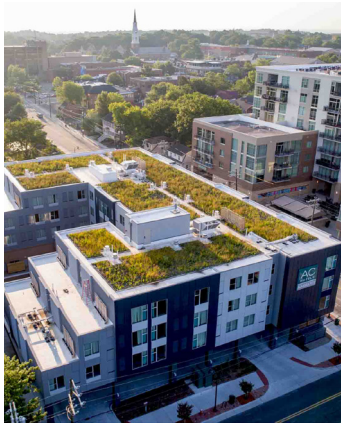
ACTIONS

- Town-wide EV charging
- Bus rapid transit (BRT) + electric buses
- Mobility Plan build-out

TARGETS

- Charging stations: 1,400 Level 2 + 99 Level 3 by 2050
- Complete North-South BRT by 2025
- Implement Mobility Plan by 2035

3. Sustainable development ▼ 10-11%



ACTIONS

- Green building policy
- Plan for walkable, transit-served communities
- Provide zoning incentives
- Add to tree canopy and greenery

TARGETS

- 100% net-zero emissions development by 2030
- More walkable, transit-served areas by 2050

4. Green building retrofits ▼6-7%

ACTIONS

- Upgrade existing buildings
- Upgrade Town facilities

TARGETS

- Convert 15k buildings to all-electric by 2050
- Halfway to net zero by 2050: 15% of commercial, 30% of residential, 100% of Town buildings

5. Green infrastructure ▲ resiliency

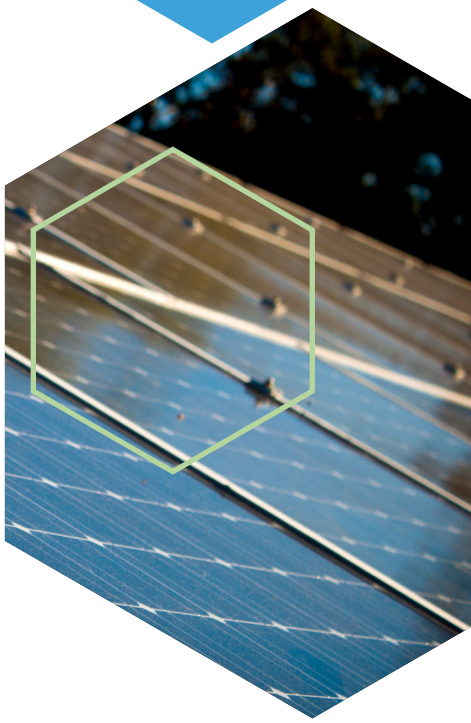
ACTIONS

- Green infrastructure planning + implementation
- Tree planting + invasive species removal

TARGETS

- Green Infrastructure ordinance by 2022
- Complete top 3 subwatershed study stormwater projects by 2025
- Plant 200+ trees per year

Timeline for Climate Action and Response Plan Implementation



2020
CARP drafted

2021
CARP adopted, implementation begins

2022
Green infrastructure ordinance enacted

2023
Green building policy adopted, LUMO Rewrite enacted

2024
EV bus pilot ends, Solid Waste Master Plan complete

2025

- Next 5-Year Plan Update
- Top 3 stormwater projects complete
- 11 fleet vehicles electrified
- MSC replaces 4 municipal buildings *
- 40% of new bldgs all-electric
- 50% of new bldgs net-zero
- Replace 10 buses with all-electric
- Bus rapid transit online

MSC = municipal service center, designed to meet AIA 2030 Challenge

2030

- 100% of new bldgs all-electric
- 100% new bldgs net-zero
- Half of Town facilities 50% net-zero
- 10% of residential is 50% net-zero
- 5% of commercial is 50% net-zero
- 11,151 electric vehicles
- 7,500 all-electric buildings

2040

- Mobility Plan implemented ('35)
- 10% reduction in vehicle miles
- 20% of residential is 50% net-zero
- 10% of commercial is 50% net-zero
- 25,371 electric vehicles

2050

- Zero waste ('45)
- 100% of buildings all-electric
- 30% of residential is 50% net-zero
- 15% of commercial is 50% net-zero
- Duke Energy + Dominion carbon neutral
- 35% or greater car travel to walk/bike/bus

Mitigation and Resilience

The Climate Action and Response Plan includes strategies the Town and community can take to reduce or "mitigate" greenhouse gas emissions or adapt to the effects of climate change by making our community more resilient.

What is Mitigation?

Mitigation and resilience strategies work together to achieve climate goals. They are a form of long-term adaptation (or resilience). Mitigation strategies seek to:

- Reduce or eliminate GHG emissions
- Remove GHGs from the atmosphere through carbon sequestration or other measures

What can I do to make a difference?

You don't have to work for the Town or represent a partner organization to make a difference. Everyone can contribute by making a few greener choices. If everyone takes a small action, it can make a big impact! Here are a few simple ways you can help:

- Walk, bike, ride a bus, or go car-free
- Switch to a more efficient car or electric vehicle
- Use reusable products, like water bottles, cloth napkins, or soap dispensers
- Plant a native tree, shrub, herb or groundcover
- Capture rainwater from your roof for reuse or put in a rain garden
- Compost
- Choose products with less packaging
- Eat a more plant-based and local diet
- Adjust your thermostat to use less energy and save money

What makes a Resilient Community?

Climate resilience is the capacity of communities to reduce or avoid impacts from potential climate changes and stresses, recover quickly or "bounce back", and even improve community environmental, social, physical, and economic well-being in order to "bounce forward." Resilience or adaptation strategies focus on how we prepare for and respond to the changes that are already happening in our climate.

Resilience strategies may include:

- Providing resources for at-risk populations vulnerable to climate change impacts
- Planning for severe weather and catastrophic events
- Developing early warning systems
- Building with nature using green infrastructure
- Protecting open spaces
- Improving water quality and stormwater management
- Developing partnerships, especially where issues cross political boundaries
- Supporting environmental and climate education
- Expanding economic opportunity
- Fostering social networks

Working Toward an Equitable, Sustainable, and Resilient Chapel Hill

Chapel Hill has been working to become a more equitable, sustainable, and resilient community. This involves finding a strong and lasting balance between social, economic and environmental sustainability for our community. We look for connections in all that we do. We strive to learn from our actions, monitor our progress, and innovate to solve problems.

Past Commitments and Targets

The **Town of Chapel Hill was among the first municipalities in the U.S. to commit to reducing its own** carbon dioxide emissions by 2050 from 2005 levels.

In 2017, the **Town committed to 26-28% carbon reduction from 2005 levels by 2025** to meet the United Nations Paris Agreement.

What is an equitable, sustainable and resilient community?

- It's about asking, Who is supported by our actions and who is burdened or left out?
- It's where we protect and grow today's opportunities for tomorrow's generation.
- It's about being "future friendly/ready".
- It means decisions and actions that leave Chapel Hill's people, economy and environment better than we found them.
- It's about preparation so we can bounce back from sudden change.
- We believe a sustainable and resilient Chapel Hill is the work of everyone who lives, works, visits, and goes to school here.

In 2016, the United Nations Paris Agreement called all nations to combat climate change and adapt to its effects. Participating nations and communities are committed to limiting the temperature increase this century below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit the increase to just 1.5 degrees.

What has Chapel Hill done so far to address climate change and become more sustainable and resilient?

- Participated in Triangle Regional Resilience Assessment
- Energy upgrades in Town facilities
- Green Building Ordinance
- Energy savings with rezonings
- Northside Energy Saver Program
- LED lighting upgrades
- Fare free transit
- Mobility Plan
- Green municipal fleet
- Electric vehicle charging stations
- Trails and greenways
- Commute Alternative Program
- Drive-thru Ordinance
- Stormwater management
- Water conservation with Orange Water and Sewer Authority
- Subwatershed studies
- Illicit Discharge Ordinance
- Jordan Lake Rules
- Explore More at Pritchard Park
- Smart City projects
- Solar on town buildings
- SolSmart community designation
- Renewable energy evaluation
- Tree Planting Program
- Open space protection and acquisition
- Coal ash remediation
- Recycling
- Composting pilot
- Green purchasing
- Creation of the Rural Buffer
- Creation of the Resource Conservation District (RCD)

Chapel Hill Climate Goals

The Town of Chapel Hill is committed to reducing Greenhouse Gas (GHG) emissions at the Community-wide level and for Town operations.

Governor Roy Cooper issued an executive order in support of the Paris Agreement in 2018. The order commits to reducing statewide GHG emissions to 40% below 2005 levels by 2025.

Town & Community Goals

50%
reduction by 2030

net-zero
by 2050

80%
clean, renewable energy by 2030

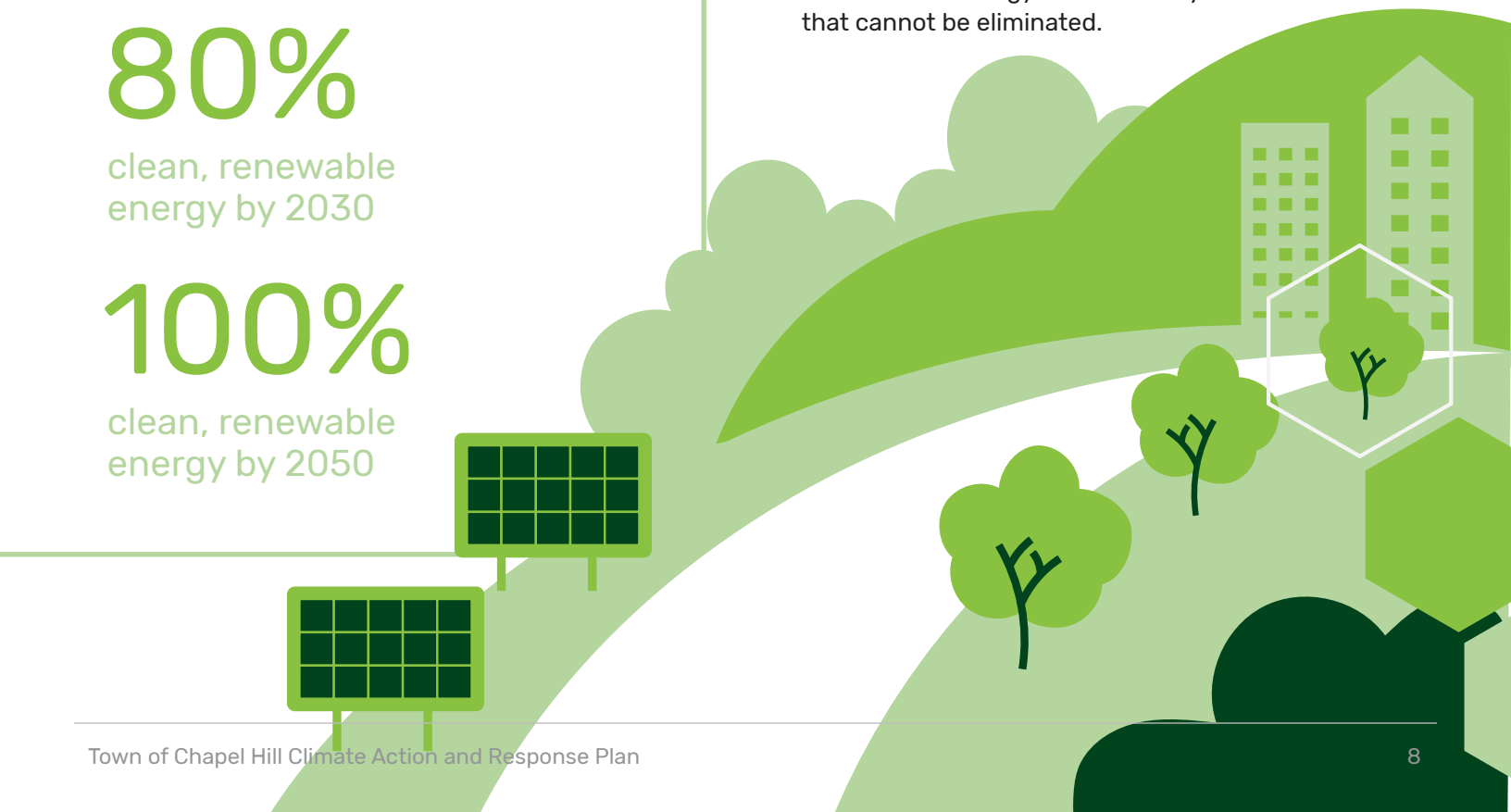
100%
clean, renewable energy by 2050

What is clean, renewable energy?

Renewable energy is derived from natural processes that are regenerative over short periods of time or cannot be depleted such as solar, wind or geothermal. Clean energy comes from renewable energy sources that do not generate emissions.

What is net zero?

Net zero emissions means achieving a balance between activities that create GHG emissions with those that remove them from the atmosphere. Another term for net zero is “carbon neutral.” Today, reaching net zero emissions often requires the use of renewable energy to "offset" any GHG emissions that cannot be eliminated.



Challenges and Opportunities

Addressing climate change will not be easy. There are economic, societal, governmental, regulatory, and technological challenges that must be overcome to make significant progress. However, there are significant opportunities available too. Our community can expect our climate actions to result in many shared benefits that go beyond climate, like improved racial equity, public health and resilience. Challenges and opportunities with implementing climate action were identified through working sessions with Town staff, the climate action opinion survey, advisory board and commission review, and the Community Partners Climate Action Summit.

Challenges

Town's authority to act is limited by what the State allows.

Regional growth pressures

Continuing climate change brings new challenges

Lack of understanding of climate change and resilience issues

Climate burdens are not felt equally across Chapel Hill communities

Difficulty in reaching everyone affected

Resistance to change

Slow transition to sustainable development patterns

The Town has limited control over community emissions and actions that contribute to climate change

Insufficient funding to meet climate goals

Improving and maintaining stormwater controls

Need for investments in major technology shifts, such as electric vehicles

Insufficient funding to meet climate goals

Opportunities

Set policies and practices that address racial inequities and drive outcomes

Build on statewide goal of reducing GHG emissions by 40% by 2025 (Executive Order 80)

Leverage Duke Energy and Dominion's goal of being carbon neutral by 2050

Seek out new funding opportunities (grants, partnerships)

Establish new policies, incentives, regulations and partnerships that impact our two largest emissions sectors – buildings and transportation

Adopt more sustainable development and land use policies

Continue modeling best practices in energy use

Strengthen hazard mitigation and community resilience

Continue improving stormwater management

Promote and support sustainable living

Grow and leverage community partnerships

Create more sustainable economic and job opportunities


TOP OF THE HILL
S Columbia

Greenhouse Gas (GHG) Inventory

What is a GHG Inventory?

A GHG inventory helps us measure and monitor how much we as a community are contributing to climate change and whether or not we're on track to meet our goals. The first inventory we did back in 2005 created an initial set of numbers or "baseline" that we now use as a way to measure our progress and identify opportunities for improvement.

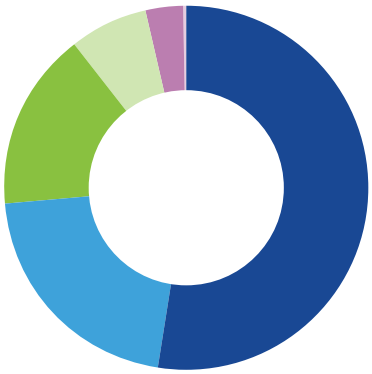
Two GHG inventories were prepared for Chapel Hill. The first assesses emissions at a community-wide level, and the second focuses on emissions resulting from municipal actions.

What standards guide the GHG Inventory process?

The GHG inventory follows the U.S. Community GHG protocol developed by ICLEI Local Governments for Sustainability. The calculations meet the standard reporting requirements defined by the Global Protocol for Community Scale Emissions Inventories. These protocols provide standards methods for estimating emissions from specific sources and activities.

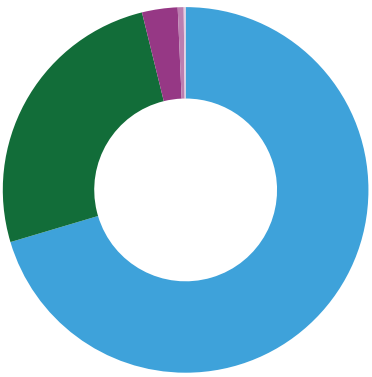
For more details on the Town and Community GHG Inventory, visit the full GHG inventory in the appendices.

Municipal GHG Emissions by Sector



- 52.5% Vehicle Fleet
- 21.2% Facilities
- 15.8% Employee Commute
- 7.1% Streetlights & Traffic Signals
- 3.3% Solid Waste
- 0.1% Water

Community GHG Emissions by Sector



- 69.7% Buildings
- 26.4% Transportation
- 3.2% Waste
- 0.5% Wastewater
- 0.2% Water

DID YOU KNOW...

The transportation sector is the largest source of GHG emissions in the U.S. (28%), which mostly comes from the burning of fuels like gasoline and diesel.

What is included in our Community GHG Inventory?

The Chapel Hill community GHG inventory assesses emissions for the 2017 calendar year because it is the most recent year for which actual data is available for all sectors. The inventory looks at sources of GHG emissions by sector, as follows:

Buildings – The buildings sector includes the emissions from generating and using energy to power the buildings in which we live, work and play. It includes everything from the emissions coming from running power plants and manufacturing equipment to the refrigerators in grocery stores and movie theater projectors, to plugging in your cell phone charger or cooking on your stove. Across the community, about 80% of the GHGs from buildings are a result of electricity use and 20% from natural gas.

Transportation – The transportation sector includes emissions resulting from fuel consumption from all of the vehicle miles traveled on roads within the Town of Chapel Hill. This includes personal, commercial cars, trucks and buses.

Waste – The waste sector includes the emissions associated with the disposal of solid waste, including landfill and compost waste. Landfills are significant sources of GHGs, particularly methane.

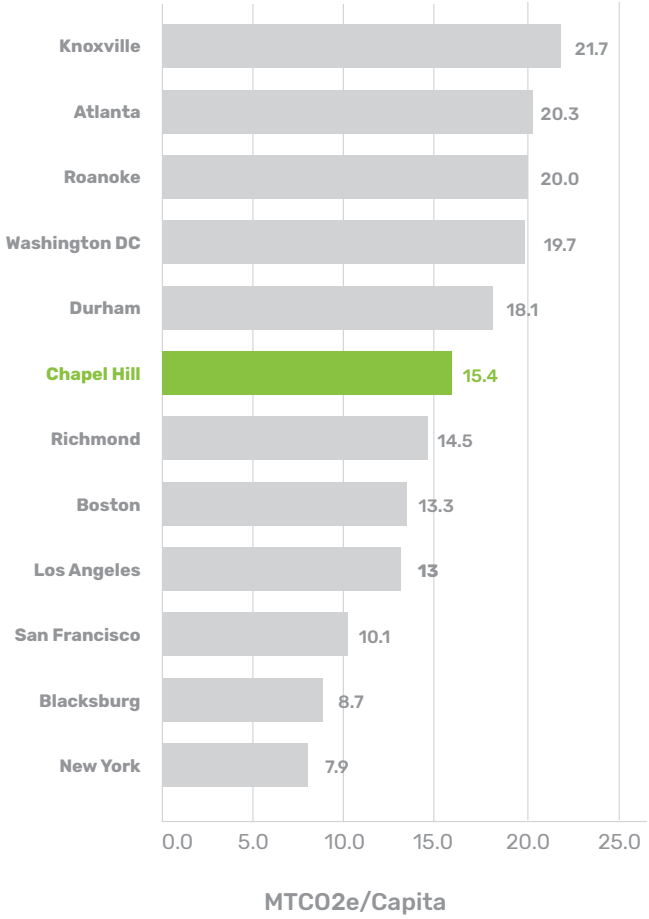
Wastewater Treatment – The wastewater treatment sector accounts for the emissions that result from the wastewater treatment process.

Water – The water sector includes emissions associated with delivering water throughout the community.

How are GHGs measured?

GHGs are measured in terms of carbon dioxide equivalent, or CO2e. This measurement converts the effects of different GHGs to the amount of carbon dioxide that would cause the same amount of warming so it can be expressed as a single number. The GHG inventory calculates GHG emissions in metric tons of CO2e, or MTCO2e.

Resident Carbon Footprint Comparison



What is included in the Municipal GHG Inventory?

The Town of Chapel Hill is committed to reducing the GHG emissions within its control. The Municipal GHG inventory is a subset of the community GHG inventory that takes a closer look at emissions from Town operations. Municipal GHG emissions are broken down into the following sectors:

Vehicle Fleet - The vehicle fleet sector calculates emissions based on vehicle miles traveled and fuel consumption for the cars, trucks, and buses owned and operated by the Town.

Facilities - The facilities sector is similar to the overall buildings sector in the community inventory. It accounts for emissions resulting from energy consumption in buildings that are owned and operated by the Town. Outdoor lighting is also included in these calculations.

Employee Commute - The employee commute sector is based on the miles traveled by Town employees going to and from work. It accounts for the types of commutes Town employees use, including driving alone, carpooling, or walking.

Streetlights and Traffic Signals - The streetlights and traffic signals sector calculates emissions from the electricity used to power streetlights and traffic signals that are owned and operated by the Town.

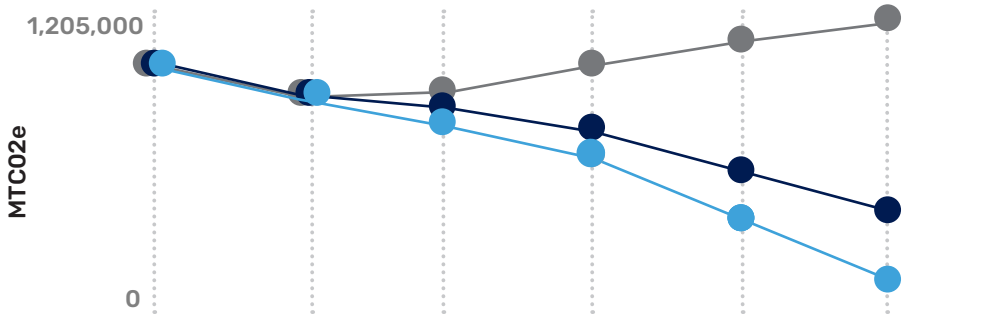
Solid Waste - The solid waste sector accounts for waste generated at Town facilities and sent to a landfill.

Water - The water sector includes both water treatment and delivery, and represents emissions that result from energy consumption from water treatment, extraction, pumping and supply for the amount of water supplied to Town facilities and operations.

GHG Projections

What is Business as Usual?

The Business as Usual forecast predicts what the GHG emissions in our community would be if we did not take any further climate actions. It considers population growth, current efforts, and anticipated improvements in vehicle and appliance efficiency.



2005	2017	2025	2030	2040	2050
1,047,516	914,825	926,211	1,032,121	1,123,766	1,203,836
1,047,516	914,825	865,410	780,384	615,956	462,154
1,047,516	914,825	796,044	667,664	416,528	176,018

- Business as Usual
- **Climate Action & Response Plan (CARP) Implementation**
- **CARP + UNC Climate Actions**

*2005 GHG estimates are based on Orange County data, apportioned based on population.

What do Chapel Hill's emissions mean?

Climate change is a global process. If global temperature increases are to be limited to 2 degrees or less this century as the Paris Agreement states, it's every community's responsibility to reduce their GHG emissions proportionally.

Our community has made great progress since we began in 2006, but additional GHG reduction efforts are needed to meet our goals. **The graph above illustrates how the measures outlined in this plan can help us reach our goals in support of the Paris Agreement.**


TAR HEEL
BIKES

UNC-Chapel Hill's Greenhouse Gas Emissions

In 2019, UNC-Chapel Hill emitted 473,906 metric tons of carbon dioxide equivalents. This marks a 21% decrease from the 2007 baseline and the fifth consecutive year Carolina has reduced its greenhouse gas (GHG) emissions. This 21% reduction surpassed Carolina's 2020 goal of a 20% emission reduction. The reduction in 2019 was primarily driven by a decrease in coal use but was partially offset by an increase in commuting emissions. Carolina's full emissions trend can be seen in Figure 1 and a breakdown of 2019 emissions can be seen in Figure 2.

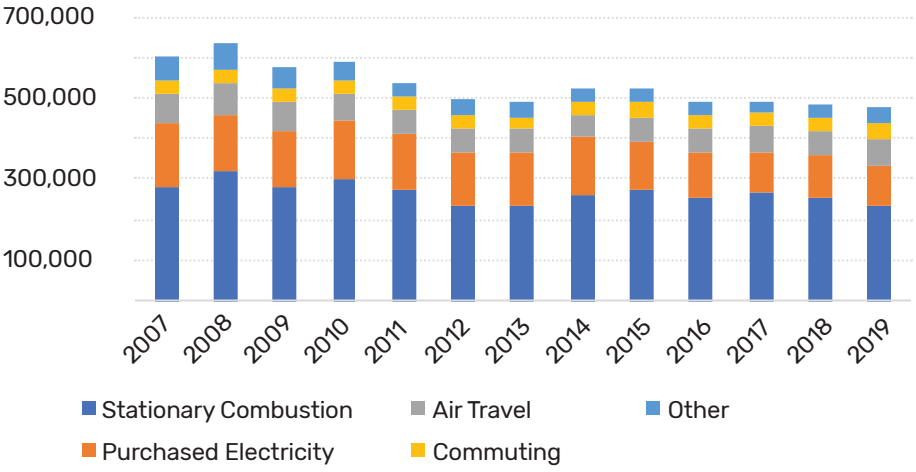


Figure 1. GHG Emissions by Category Since 2007

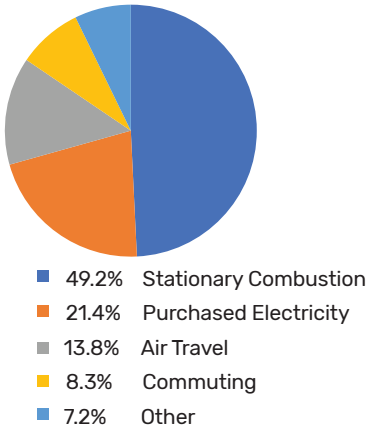


Figure 2. Breakdown of 2019 GHG Emissions

CAROLINA'S GREENHOUSE GAS AND ENERGY GOALS

In 2007, the University of North Carolina at Chapel Hill became a charter signatory of the American College and University President's Climate Commitment (ACUPCC). Carolina's 2009 Climate Action Plan then established a carbon neutrality date of 2050 and interim targets of a 20% reduction by 2020 and a 30% reduction by 2030.

Regarding energy efficiency, Carolina is currently working towards Governor Cooper's Executive Order 80 which states the state will strive to reduce building energy use intensity by at least 40% by 2025 from the 2005 baseline. Carolina has exceeded its previous goal of a 30% reduction in energy use intensity. In fiscal year 2019-20, Carolina had reduced its Energy Use Intensity (Btu/GSF) by 36% compared a 2002-2003 baseline.

CAROLINA'S GREENHOUSE GAS REDUCTION STRATEGIES

To meet Carolina's 2030 goal, and move the University to carbon neutrality, many carbon reduction strategies will be needed. A few of Carolina's main strategies are laid out below.

INCREASE ENERGY EFFICIENCY ON CAMPUS

Carolina's Energy Management team is continuously working to reduce campus energy use through low-cost energy conservation projects. These include LED retrofits, airflow reduction projects, HVAC optimizations and many more. Carolina also has a building optimization program that ensures buildings are functioning as designed to limit energy use.

ELIMINATE COAL USE

Carolina is working to eliminate coal use in the cogeneration facility as quickly as is technically and financially feasible without losing any reliability or resilience. In 2019, Carolina completed a burner restoration project at the cogeneration facility that will allow Carolina to significantly increase its natural gas use and reduce coal consumption.

INCREASE USE OF RENEWABLE ENERGY

Generating and purchasing renewable electricity is extremely important in lowering Carolina's emissions. Carolina is currently working on multiple on-site solar photovoltaic installations and is assessing its options for procurement of off- site renewable energy through Duke Energy.

ADDITIONAL STRATEGIES

Other strategies Carolina is using to limit its greenhouse gas emissions include increasing alternative commuting methods, using alternative fuels in fleet vehicles, prioritizing local foods, and educating its community members about how to reduce their personal footprints on and off campus.


Greetings from
CHAPEL HILL
Scott Nurkin ©
@themuralshop

Community Engagement in Climate Action

The Climate Action and Response Plan is a plan for the whole community, not just the Town. Approximately 99% of GHG emissions in Chapel Hill are the result of non-municipal activities from sources like vehicles, homes, businesses, and institutions. The Town government can't reach our community's goals by itself, but a network of committed partners working throughout our community can. Climate action and response relies on community-wide partnerships to build a foundation for broad action.

How was the community involved in developing the Plan?

Community engagement has been ongoing through the Town's sustainability efforts in recent years and has been incorporated into the climate action planning process. The Town solicited community input on the plan through online surveys, shared information through social media, advisory board meetings, and gathered stakeholders together in a Community Partners Climate Action Summit. Thirty-six individuals representing a variety of stakeholder organizations participated in the Summit. These community leaders and others will be engaged in future climate action outreach.

How will the community stay engaged in climate action moving forward?

The Climate Action and Response Plan needs community involvement. The Town has developed and will continue to develop COVID-safe engagement resources including presentations, online surveys, and toolkits for use by community partners so that they can continue to share information and engage with the community for future climate action. We will continue to build on partnerships and develop relationships throughout the community to support climate action.

Chapel Hill Municipal and Community Emissions

Community	514,431
Municipal	12,378
UNC	388,012
Total	**914,821**

Scope 1 and 2 emissions (MTCO2e)

Engagement Activities

COVID-19 hit our community just as the public engagement portion of the project began. We responded by implementing a variety of online engagement strategies. This work included a video and survey that were published in English, Spanish and Mandarin Chinese, as well as virtual meetings and virtual office hours.

Community Opinion Survey

Following the climate action community partners summit, we launched a wider climate action opinion survey featured on the town's sustainability website (sustainchapelhill.org) and on social media. The survey focuses on the challenges and opportunities that individual community members see to implementing climate action.

Key Thoughts from Community Survey

- Challenges include limited Town control and taking action that is accessible and affordable for all
- Needs include incentives, partnerships and advocacy to drive action

Respondents said the Town should:

- Plan for a community that requires less driving and supports more walking, biking and transit service
- Build more climate-resilient infrastructure
- Adopt climate-smart development rules

Metroquest Survey

Ahead of the summit, we distributed a targeted survey to key community stakeholders and organizations to solicit input on community priorities, focus areas for climate action, and ideas for working together between the Town and community.

Chapel Hill Climate Action Video

We uploaded a climate action plan video to the Town's sustainability website to share information on the project and encourage participation in the community survey.

Wider Community Benefits of Climate Action

Most climate actions offer a variety of benefits in addition to mitigating GHG emissions or improving resilience to climate change. These are referred to as co-benefits and include:

- Improved racial equity outcomes
- Environmental justice
- Lower costs and greater affordability
- Improved energy security and reliability
- Decreased risk of energy shortages or outages
- Reduced pollution
- Improved air quality
- Improved health outcomes
- Improved economy
- Expanded local jobs creation
- Expansion of transportation choices
- Reduced traffic congestion
- Improved safety
- Improved disaster preparedness
- Reduced flooding risk
- Enhanced and protected natural environment
- Increased ecosystem and habitat resilience
- Reduced water consumption
- Reduced waste and litter

How do businesses benefit from taking climate action?

Mitigating and adapting to climate change makes our community cleaner, healthier, and more resilient, and that's good for our economy. Major global investors and large corporations are starting to include sustainability actions to reduce their risk to climate impacts. Businesses with experience in climate action and response have found that it also leads to:

- Lower costs, increased efficiency, and higher profits
- Innovative ideas
- Competitive advantages in attracting and retaining talent
- A comprehensive understanding of the full environmental, social, and economic impacts of their operations
- Insight into future possibilities and investment opportunities
- Marketing and branding opportunities
- Reduced risk and increased productivity

Taking Action Together

The Climate Action and Response Plan focuses on taking action together. Actions are centered on the four areas identified below and are described in more detail throughout the following pages in this section. "Town Government Actions" are those that we as a local government have the ability to initiate or do ourselves. "Town & Community Actions" are those where we don't have full authority and need to work with others to achieve our goals. Taking all of the actions listed below will help us implement the top five action categories described above, while also building community capacity and resiliency.

Buildings & Energy

Transportation & Land Use

Waste, Water & Natural Resources

Resiliency

TOWN GOVERNMENT ACTIONS

- Update Green Building Policy for new construction
- Net-zero emissions for new municipal buildings
- Energy upgrades for existing municipal green buildings & facilities
- Create walkable, bikeable, transit-served neighborhoods
- Increase walking, biking & transit use (mode-shift)
- Electrify the municipal fleet
- Electrify the transit fleet
- Increase transit ridership and implement Bus Rapid Transit (BRT)
- Protect water quality, natural, & agricultural resources
- Enhance green infrastructure
- Strengthen early warning systems for climate hazards & heat

TOWN & COMMUNITY ACTIONS

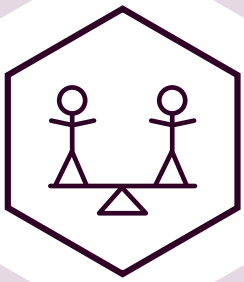
- Net-zero emissions for new construction
- Energy upgrades for existing buildings & facilities
- Convert community buildings to all-electric
- Green the grid
- Create a Town-wide EV charging station network
- Expand Transportation Demand Management (TDM) programming
- Produce zero waste
- Broaden community-wide resiliency & recovery actions
- Expand climate action education, outreach, & awareness
- Grow partnerships, funding, & incentives

Key Benefits of Taking Action

Many wider benefits will result from our community taking climate action, sometimes referred to as “co-benefits”. Several co-benefits are highlighted for the proposed actions which focus on climate equity and the overall wellbeing and sustainability of our community.

Public and Environmental Health

Improving air and water quality, stormwater management, recreation, mental health and other ecosystem service benefits.



Racial Equity and Climate Justice

Addressing inequities in climate change burdens on frontline community members and achieving an equitable distribution of climate action benefits.

Regional Partnerships

Working collaboratively across the region to take action.

Resilience to Stressors

Improving our ability to bounce back and bounce forward in the face of climate change.

Job Creation

Investment in sustainability creates a green economy, with local jobs that pay a living wage like: solar installer, green builder, sustainable farm manager, EV station installer, etc.

Climate Action Summary Tables

The following summary tables show the potential impacts, resources needed, authority, and co-benefits associated with all of the actions in the plan. Sections following these tables are organized by the action categories of the plan and present more detail on each. The Town's ability to carry out the actions in this plan are a function of the authority granted by the State or that of a local partnership (e.g., Chapel Hill Transit). Where the Town has **no authority** to act, strategies focused on advocacy, partnerships, and incentives are essential. Where the Town has **some authority**, we must act within the State's rules and use advocacy, partnerships, and incentives to bridge the gap. Where the Town has **full authority**, actions can be decided locally.

ACTION	GHG REDUCTION POTENTIAL (MTCO2e)	LEVEL OF INVESTMENT REQUIRED BY TOWN	TOWN'S AUTHORITY TO ACT	CO-BENEFITS
BUILDINGS AND ENERGY				
Green the grid	+ 374,022	Cost range TBD	No authority	
Net-zero emissions for new construction	+ 114,853	$*	Some authority	
Convert community buildings to all electric	+ 62,186	$*	Some authority	
Energy upgrades for existing buildings and facilities	+ 18,582	$*	Some authority	
Net-zero emissions for new municipal buildings and upgrades for existing facilities	+ 804	$$$$*	Full authority	

Legend

- \+ Positive
- Neutral
- – Negative

MTCO2e — Metric tons of carbon dioxide equivalent

- $ Town capital/program costs <$250k
- $$ Town capital/program costs $250k–$1M
- $$$ Town capital/program costs $1-5M
- $$$$ Town capital/program costs >$5M

* Exact Cost TBD

- Public and Environmental Health
- Equity/Climate Justice
- Job Creation
- Resilience to Stressors
- Regional Partnerships

ACTION	GHG REDUCTION POTENTIAL (MTCO2e)	LEVEL OF INVESTMENT REQUIRED BY TOWN	TOWN'S AUTHORITY TO ACT	CO-BENEFITS
TRANSPORTATION & LAND USE				
Create a town-wide electric vehicle (EV) charging station network	+ 107,028	$$$ $1.7M	Some authority ●	
Expand TDM and plan for mobility on-demand network	+ 24,119	$-$$*	Some authority ●	
Create walkable, bikeable, transit-served neighborhoods	+ 19,905	$*	Some authority ●	
Increase walking, biking and transit use (mode-shift)	+ 12,505	$$$$*	Some authority ●	
Electrify the transit fleet	+ 4,572	$$$$ $2.82M	Some authority ●	
Increase transit ridership and implement Bus Rapid Transit (BRT)	+ 2,305	$$$ $200M	Some authority ●	
Electrify the municipal fleet	+ 803	$$ $480,000	Full authority ●	

Legend

+ Positive
○ Neutral
− Negative

MTCO2e Metric tons of carbon dioxide equivalent

TDM is Transportation Demand Management (see glossary of terms for more)

$ Town capital/program costs <$250k
$$ Town capital/program costs $250k–$1M
$$$ Town capital/program costs $1-5M
$$$$ Town capital/program costs >$5M

* Exact Cost TBD

Public and Environmental Health
Equity/Climate Justice
Job Creation
Resilience to Stressors
Regional Partnerships

ACTION	GHG REDUCTION POTENTIAL (MTCO2e)	LEVEL OF INVESTMENT REQUIRED BY TOWN	TOWN'S AUTHORITY TO ACT	CO-BENEFITS
WASTE, WATER, AND NATURAL RESOURCES				
Produce zero waste	+ Amount TBD	$$$$*	Some authority	
Protect water quality, natural, and agricultural resources	+	Cost range TBD	Some authority	
RESILIENCY				
Expand climate action education, outreach, and awareness	+	$-$$* Amount TBD	Full authority	
Grow partnerships, funding, and incentives	○	Cost range TBD	Some authority	
Enhance green infrastructure	+	Cost range TBD	Some authority	
Strengthen early warning systems for climate hazards and heat	○	Cost range TBD	Full authority	
Broaden community-wide resiliency and recovery actions	○	Cost range TBD	Some authority	

Legend

+ Positive
○ Neutral
– Negative

MTCO2e Metric tons of carbon dioxide

$ Town capital/program costs <$250k
$$ Town capital/program costs $250k–$1M
$$$ Town capital/program costs $1-5M
$$$$ Town capital/program costs >$5M

* Exact Cost TBD

Public and Environmental Health
Equity/Climate Justice
Job Creation
Resilience to Stressors
Regional Partnerships

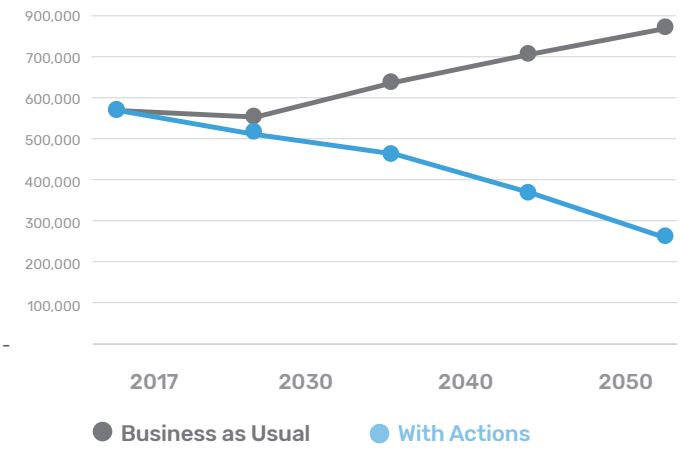
Buildings & Energy

OVERVIEW

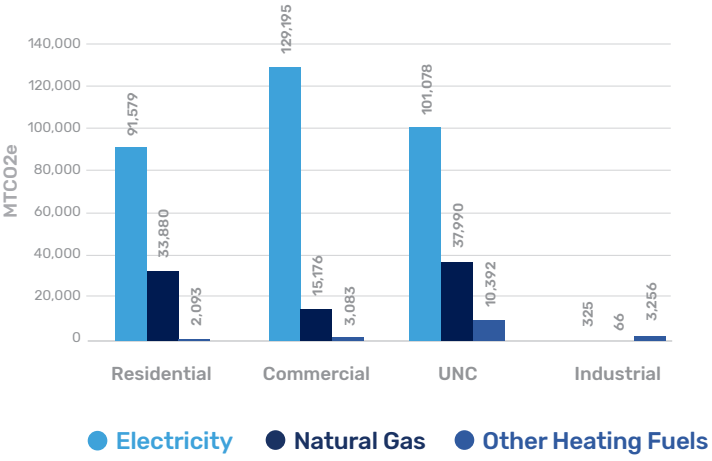
Together, buildings and energy account for the largest share of GHG emissions in our community (69%). Improving the efficiency of existing and new buildings, reducing energy use, and transitioning to cleaner energy sources can help reduce GHGs from the building and energy sector. State and local goals for GHG reduction and becoming carbon neutral rely on changes in energy supply and its use in buildings.

Current and Forecast Greenhouse Gas Emissions from Buildings & Energy

Existing and Forecast GHGs from Buildings - "Business as Usual" v. Taking Action (MTCO2e)



2017 Community GHGs from Building Energy (MTCO2e)



CARBON NEUTRAL

Carbon neutral means taking actions to remove as much carbon dioxide and other greenhouse gases from the atmosphere as we put into it, achieving net-zero carbon emissions.

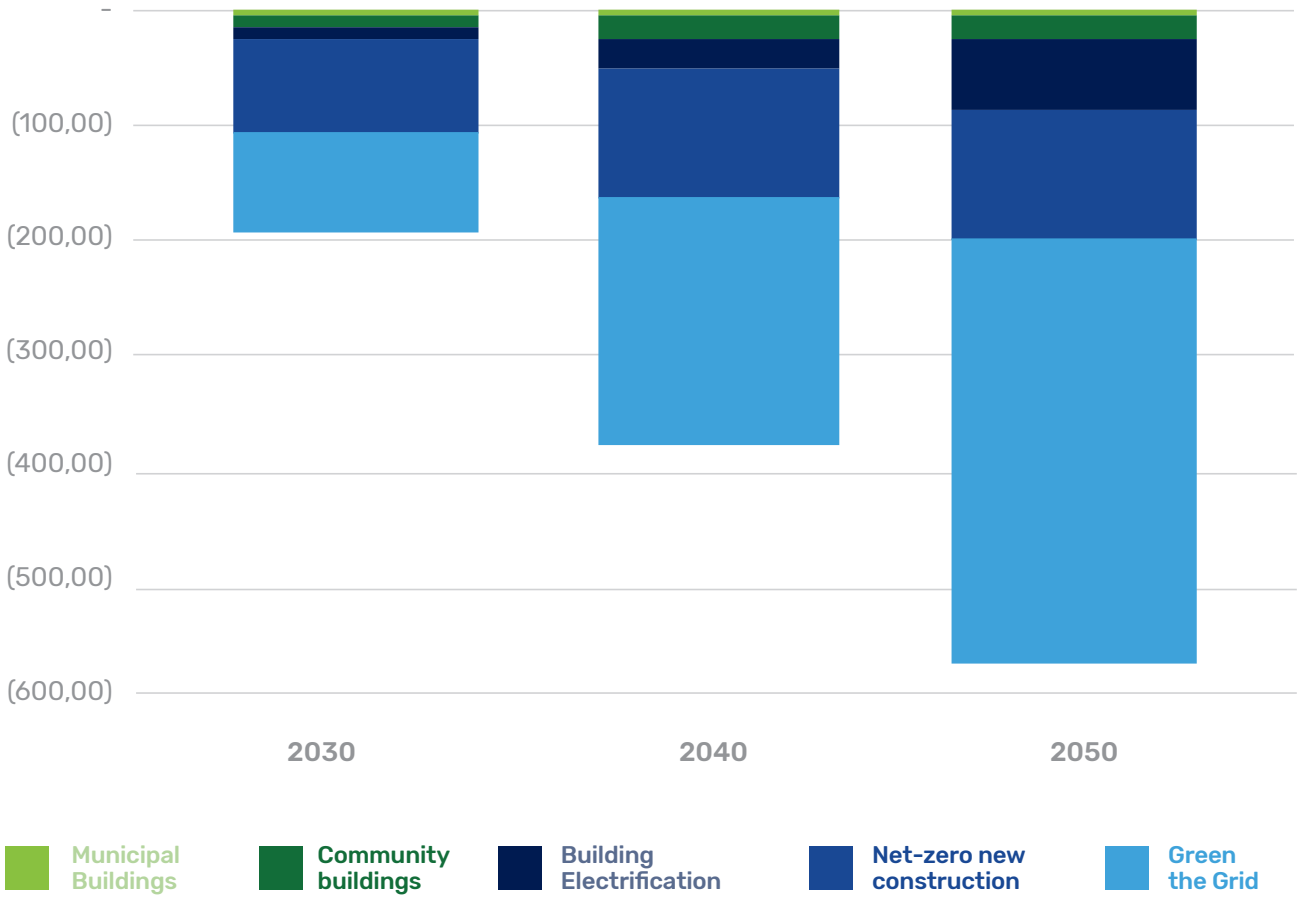
Top Buildings & Energy Actions

TOWN GOVERNMENT ACTIONS	TOWN & COMMUNITY ACTIONS
Update Green Building policy for new construction	Net-zero emissions for new construction
Net-zero emissions for new municipal buildings	Energy upgrades for existing buildings & facilities
Energy upgrades for existing municipal buildings & facilities	Convert community buildings to all-electric
Incentives for net-zero emissions for new construction & energy upgrades for existing buildings	Green the grid

Buildings & Energy

POTENTIAL REDUCTION IN GREENHOUSE GAS EMISSIONS

Forecast GHG Emissions Reduction Potential from Top Actions for Buildings and Energy (MTCO2e)



Buildings & Energy Metrics

INDICATOR	MEASURE(S)	HOW/WHY WE MEASURE
Reduction in GHGs for buildings and energy sector	MTCO2e by sector	Energy efficiency upgrades and an increase in clean energy will lead to a corresponding decrease in GHGs
Percent of energy from clean, renewable sources	Percent	To meet our stated goals, the percentage of energy coming from clean sources must increase over time.
Number of buildings meeting LEED or similar standards	Percent	More buildings meeting green building goals indicate that we are building greener.

Climate Action Category:
Buildings & Energy

Town's authority to act:
High-impact Action: ▼ 9%

ACTION

Net-Zero Emissions for New Construction

Our homes, offices, schools, stores, and other buildings account for a large portion of our community's GHG emissions. Each building's design and construction determines how it affects the environment. Green building means making environmentally friendly choices in how buildings are designed, built, and operated. Green building strategies lower emissions, reduce other environmental negative impacts, and save money.

The Town can address green building through a **Green Building policy** that updates the Council's current one, and with the creation of **zoning incentives** for green building practices. Green building is also a tool for creating and maintaining more **affordable housing** because projects are designed to have lower utility bills and be located in places with access to fare-free Transit and other travel options.

Vision + Target

Achieve 100% zero net energy in new construction buildings by 2050.

Strategies to advance this work over the next five years:

- Update the Council's Green Building policy for new construction by 2023, with substantial improvements by 2022
- Create voluntary pathways and other incentives for net-zero construction as part of the LUMO rewrite
- Continue participating in and advocating for higher efficiency standards as part of the building code update cycle
- Advocate for the creation of innovative financing tools that can support net-zero construction (e.g., property assessed clean energy, North Carolina Clean Energy Fund)

Estimated implementation costs

Exact costs to update the policy and rewrite the LUMO are TBD

WHAT IS THE TOWN ALREADY DOING?

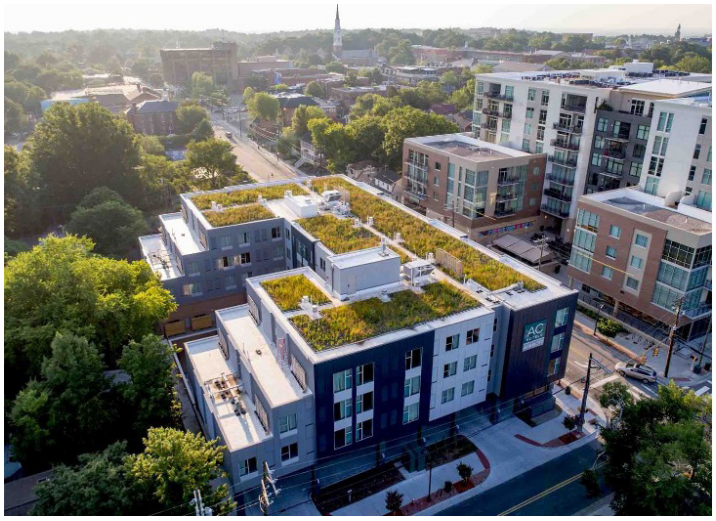
The Town has previously encouraged developers to design projects that are "20 percent more energy efficient than the latest version of ASHRAE 90.1" and incorporate green building practices. The Environmental Stewardship Advisory Board reviews development projects and makes recommendations to Council regarding net-zero design and other leading standards.

WHO WITHIN OUR COMMUNITY CAN HELP?

- Architects/Engineers
- Green building and zoning experts
- Contractors
- Lenders
- Building owners/investors
- UNC-Chapel Hill

ACTION

Net-Zero Emissions for New Construction



AC Hotel on Rosemary Street with green roof installed by Living Roofs, Inc.

DID YOU KNOW...

As the electricity grid gets cleaner with more renewable energy (see Green the Grid action), the energy savings from net-zero construction will remain but the GHG reduction potential is less as we get to 2050 and beyond. This means the earlier we reach net-zero construction the better, and that this type of design will save energy for years to come.

PROJECT EMISSIONS REDUCTION (MTCO2E)	2030: 85,567	2040: 115,950	2050: 114,853

OTHER BENEFITS

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+	+	+	○
Potential Impacts	+ Improved indoor and outdoor air quality + Positive health outcomes for those who live and work in green buildings + More natural resources protected & preserved	+ Improved environmental conditions + Lower operating and utility costs + More affordable housing opportunities	+ Jobs for green builders and solar installers	+ Lower energy needs easier to address with battery backups	

Legend

+ Positive ○ Neutral — Negative

Climate Action Category:
Buildings & Energy

Town's authority to act: ●
GHG Reduction: ▼ 804 MTC02e

ACTION

Net-Zero Emissions for New Municipal Buildings

Upgrading or "retrofitting" our existing Town government buildings to bring them up to energy and water efficiency standards can reduce the Town's annual emissions. Constructing any new Town buildings to meet these standards will also keep emissions as low as possible. Independent industry standards can guide the Town's efforts to improve existing buildings and design new ones, when they are needed.

Vision + Targets

Achieve 100% net zero emissions in new municipal buildings and 50% in existing buildings by 2030.

Strategies to advance this work over the next five years:

- Maintain commitment to using the Leadership in Energy and Environmental Design (LEED) green building rating system that provides a framework for healthy, highly efficient, and cost-saving buildings (see glossary of terms for more about "green building")
- Maintain commitment to using the American Institute of Architects (AIA) 2030 Challenge which sets targets for GHG-emitting and energy consumption performance standards that progressively increase to being carbon-neutral in 2030
- Continue assessing public housing buildings and prioritize investment in energy and water efficiency upgrades to lower utility bills
- Continue assessing existing Town buildings and facilities and invest in energy and water efficiency upgrades to lower utility bills
- Explore options for enhanced refrigerant management in Town facilities and update standard operating procedures, as needed

Estimated implementation costs

Exact costs to build the Municipal Service Center (MSC) to meet Town standards are TBD. MSC could replace up to four existing and less energy-efficient Town buildings by 2025. Assessment costs for public housing and other Town facilities are TBD.

WHAT IS THE TOWN ALREADY DOING?

Through the Town's Green Building Ordinance for municipal facilities, most recently amended in 2017, new or expanded Town government facilities are built to meet the American Institute of Architects (AIA) 2030 Challenge for fossil fuel reduction targets and LEED rating systems.

WHY BUILD GREEN?

In addition to reducing operating costs and lowering greenhouse gas emissions, green building has also been shown to increase worker productivity, help patients heal faster, improve student test scores, increase renter satisfaction, reduce tenant turnover, and generate greater awareness about the benefits of sustainable design. Some of the reasons for this include improved indoor air quality and rooms with access to natural light and views of nature.

ACTION

Net-Zero Emissions for New Municipal Buildings

The 2013 expansion of the Chapel Hill Public Library achieved a LEED Silver rating from the U.S. Green Building Council.

DID YOU KNOW...

The earlier we reach net-zero construction, the better. As the electricity grid adds more renewable energy and reaches carbon neutral by 2050, the energy savings from net-zero construction will remain but the GHG reduction potential is less.

PROJECTED EMISSIONS REDUCTION (MTCO2E)	2030: 1,487	2040: 1,202	2050: 804

OTHER BENEFITS

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+	+	+	○
Potential Impacts	+ Improved indoor and outdoor air quality + Positive health outcomes for those who live and work in green buildings + More natural resources protected & conserved	+ Improved environmental conditions + Lower utility costs (prioritization of public housing buildings)	+ Jobs for green builders and solar installers	+ Lower energy needs to address with battery backups	

Legend

+ Positive ○ Neutral — Negative

Climate Action Category:
Buildings & Energy

Town's authority to act:

High-impact Action: ▼ 18,582 MTC02e

ACTION

Energy Upgrades for Existing Buildings and Facilities

Older buildings are generally less efficient than newer buildings; however, green building strategies are often similar for new construction and upgrades (also called "retrofits"). Upgrades can range from simple, affordable improvements to more expensive and challenging ones, depending on how the building was originally designed.

Energy upgrades are investment opportunities for property owners and renters to lower operating costs and improve the satisfaction of those living and working in the buildings. The Town can provide programming and incentives to assist with and encourage building owners to retrofit their buildings with energy upgrades and other green building strategies. Community partners like utilities can help to provide **incentives** or to implement building improvements. Energy efficiency upgrades also help us meet our **renewable energy goals** by lowering the amount of energy that must be produced to meet all of the needs in Chapel Hill.

Vision + Targets

Retrofit 15% of commercial and 30% of residential buildings to 50% net-zero by 2050.

Strategies to advance this work over the next five years:

- Advocate for a state-wide Property Assessed Clean Energy (PACE) financing program
- Advocate for a North Carolina Green Bank (clean energy fund) to accelerate energy efficiency and clean energy investments
- Develop local certifications or recognition programs, including an evaluation of green rentals
- Create a "big buildings and parking lots" energy benchmarking and recognition program to track energy usage and create friendly competition among large property owners
- Determine who within Chapel Hill is experiencing energy burden in their homes or businesses
- Create an energy efficiency, beneficial electrification, and renewables program that prioritizes frontline communities, offers incentives, and links property owners to qualified local energy contractors

WHAT IS THE TOWN ALREADY DOING?

The Town is actively exploring opportunities for offering incentives and for building retrofits, including innovative and targeted financing like PACE and a North Carolina Clean Energy Fund (green bank).

WHO WITHIN OUR COMMUNITY CAN HELP?

- Community and neighborhood leaders
- Architects/Engineers
- Contractors
- Lenders
- Building owners/investors

Estimated implementation costs

Town program costs are TBD. Community investment estimated at $67M in residential (7,069 households, approx. $9,500/household); $21M in commercial retrofits (30 at $697k/retrofit); with projected net cost savings by 2040

ACTION

Energy Upgrades for Existing Buildings and Facilities

Duke Energy contractor testing a newly installed LED streetlight

DID YOU KNOW...

As part of its first guaranteed energy savings contract, the Town implemented lighting and mechanical system upgrades at Town Hall and two other locations. To date, this project has saved the Town more than $330,000 in avoided utility costs and has reached carbon savings equal to taking 180 cars off the road every year.

The Town has also worked with Duke Energy to convert more than 1,900 streetlights to LED (light-emitting diode), reducing the energy use and GHG emissions from these lights by about 50%.

PROJECTED EMISSIONS REDUCTION (MTC02E)	2030: 11,512	2040: 17,742	2050: 18,582

OTHER BENEFITS

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+/−	+	+	○
Potential Impacts	+ Improved indoor and outdoor air quality + Positive health outcomes for those who live and work in green buildings + More natural resources protected & conserved	+ Improved environmental conditions + Lower operating costs − Availability of incentives will affect equity of retrofit efforts (prioritization of frontline communities needed)	+ Jobs for weatherization contractors, lighting installers and solar installers	+ Lower energy needs easier to address with battery backups	

Legend

+ Positive ○ Neutral − Negative

ACTION

Climate Action Category:
Buildings & Energy

Town's authority to act:
High-impact Action: 5%

Convert Community Buildings to All-Electric

Building electrification, sometimes called "affordable and beneficial electrification", means converting natural gas and fuel oil energy use in buildings to electricity. This is done by replacing systems and appliances, such as heating and cooling systems and cooking appliances, to operate on electricity. This is beneficial in the long run because as our electricity grid becomes cleaner and more affordable by switching from fossil fuels like coal and natural gas to renewable energy like solar and wind, so does our use of electricity for more household purposes and business purposes.

Vision + Targets

Achieve all-electric energy for new construction by 2030. Retrofit 7,500 buildings and homes to all-electric by 2030 and 15,000 residences by 2050.

Strategies to advance this work over the next five years:

- Advocate for a state-wide Property Assessed Clean Energy (PACE) financing program
- Advocate for a North Carolina Green Bank (clean energy fund) to accelerate energy efficiency and clean energy investments
- Create a "big buildings and parking lots" energy benchmarking and recognition program to track energy use and create friendly competition among large property owners
- Create an energy efficiency, beneficial electrification, and renewables program that prioritizes frontline communities, offers incentives, and links property owners to qualified local energy contractors

INCREASING IMPACT OF BUILDING ELECTRIFICATION

Electrifying buildings with heat pumps will become more impactful as our electricity mix gets cleaner. First, these technologies will improve the overall energy efficiency of heating and cooling buildings. The remaining energy will switch from fossil fuels like natural gas to electricity. This will result in more electricity use, but far less natural gas. In the future newly added electricity use will be supplied by more renewable energy and have fewer GHGs for every new kWh added. Researchers predict that use of natural gas in homes and businesses will decline, eventually being replaced for grid resilience by hydrogen made from electricity.

Estimated Implementation Cost

Town energy upgrade program costs are TBD. Community investment estimated at up to $280M for up to 20,000 total buildings (new and existing) at $14k/residence.

WHO WITHIN OUR COMMUNITY CAN HELP?

- Property/building owners
- Developers
- Contractors
- Suppliers and retailers
- Non-profits

ACTION

Convert Community Buildings to All-Electric

Through Duke Energy's Neighborhood Energy Saver Program, 819 homes in the Northside Neighborhood area received home energy efficiency assessments and improvements that can save up to $95/year in utility bills.

DID YOU KNOW...

The Town is actively involved in the county-wide Long-Term Recovery and Transformation Plan and the Orange County Climate Council. One mutual point of interest across all municipalities within the county is home weatherization – something the towns, the Orange County Home Preservation Coalition and Duke Energy are working to advance.

PROJECTED EMISSIONS REDUCTION (MTCO2E)	2030: 7,656	2040: 28,887	2050: 62,186

OTHER BENEFITS

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+ / −	+	+	○
Potential Impacts	+ Improved indoor and outdoor air quality + Positive health outcomes for those who live and work in green buildings + More natural resources protected & conserved	+ Improved environmental conditions + Lower operating costs − Availability of incentives will affect equity of retrofit efforts (prioritization of frontline communities needed)	+ Jobs for heat pump and appliance installers	+ Lower energy needs easier to address with battery backups	

Legend

+ Positive ○ Neutral − Negative

Climate Action Category:
Buildings & Energy

Town's authority to act:
High-impact Action: ▼ 30%

ACTION

Green the Grid

Generating electricity from fossil fuels produces high levels of GHGs. Sources like solar and wind energy greatly reduce the GHGs from the energy sector. “Greening of the grid” means shifting power generation that is carried over our utility grid away from fossil fuels and toward cleaner, renewable energy sources.

The major utility providers in Chapel Hill are Duke Energy, Dominion Energy, Piedmont Electric, and UNC (to campus facilities). These major public utilities as well as renewable energy partners, local businesses, non-profits, civic organizations and homeowners can all contribute by investing in renewable energy projects that make the grid greener and cleaner. The most efficient form of renewable energy is utility-scale (e.g., solar and wind farms). At the same time, local investments in rooftop solar and geothermal help us achieve net-zero emissions buildings and increase our resiliency.

Vision + Target

Advocate for and support a fast, affordable, and just transition to clean, renewable energy sources as Duke Energy and Dominion Energy pursue their commitments to achieving net-zero carbon emissions by 2050.

Strategies to advance this work over the next five years:

- Advocate on all levels for a fast, affordable and just transition to clean and renewable energy that supports the Town's goals
- Explore options like Green Source Advantage and Community Solar, and work with utility companies to develop more utility-scale renewable projects in our area
- Support and advocate for the state and utilities to reach their goals for carbon neutrality by actively participating in public processes like Integrated Resource Plan (IRP) reviews and petitions like the one to have North Carolina join the Regional Greenhouse Gas Initiative (RGGI)
- Create an energy efficiency, beneficial electrification, and renewables program that prioritizes frontline communities, offers incentives, and links property owners to qualified local energy contractors
- Actively support UNC in their transition away from coal

Estimated implementation cost

Costs related to viable community-scale solar projects and the creation of a local energy upgrade program are TBD.

ADVOCATING FOR CLEAN, 100% RENEWABLE ENERGY

Duke Energy, Piedmont Electric Membership Cooperation, and Dominion Energy provide electricity and natural gas to our area. The Town’s goal of becoming a 100% renewable energy community is important but won’t meaningfully address climate action if this goal isn’t achieved beyond our borders, too. For this reason, we chose to work with our utility partners and representatives to advocate for a grid that is 100% clean and renewable energy. Examples of this work include actively participating and weighing in on utility integrated resource plans, as well as state and federal clean energy policy.

WHO WITHIN OUR COMMUNITY CAN HELP?

- Energy producers and suppliers
- Renewable energy partners
- UNC-Chapel Hill
- Residents

ACTION

Green the Grid

To reach their goal of a 35% reduction in purchased electricity by 2022, OWASA is currently installing large solar photovoltaic (PV) systems like the one in the photo that will generate almost 428,000 kilowatt hours of clean energy every year (equal to powering over 40 homes).

PROVIDING COMMUNITY RENEWABLE ENERGY OPTIONS

Green Source Advantage Program

The City of Charlotte is partnering with two solar energy companies and participating in this Duke Energy program to provide a 35-megawatt community level solar energy project, purchasing renewable energy through a special utility tariff rate, called a "utility green tariff". This two-year project will offset 25% of GHGs from city buildings, generate over $2 million in city utility savings, and create almost 500 new jobs.

PROJECTED EMISSIONS REDUCTION (MTC02E)	2030: 88,932	2040: 218,497	2050: 374,022

OTHER BENEFITS

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+/○	+	+	+
Potential Impacts	+ Improved indoor and outdoor air quality	+ Improved environmental conditions • Potential changes in energy costs (advocacy for affordability and equity is needed)	+ Jobs for renewable energy installers	+ Reduced dependence on fossil fuels	+ Potential for regional coordination on greening of the grid and community solar

Legend

+ Positive ○ Neutral — Negative

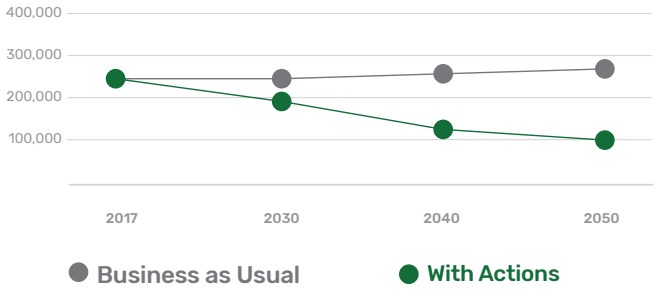
Transportation & Land Use

OVERVIEW

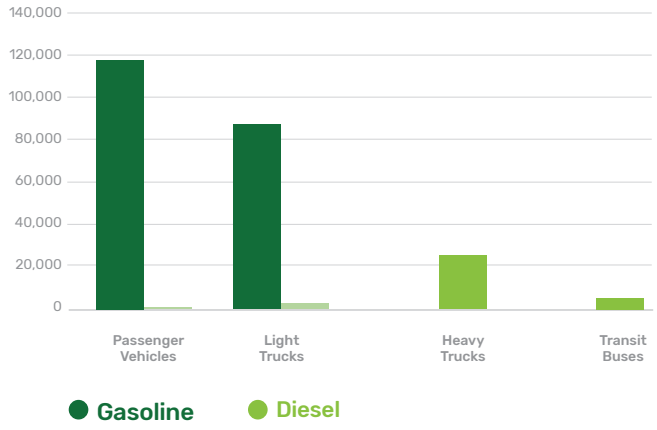
The transportation sector is the second largest source of GHG emissions in Chapel Hill (26%). Reducing emissions from transportation in our community will be a collaborative effort between the Town, regional partners, businesses, and individuals. The Town and other regional governments can encourage land use patterns that support a variety of transportation options and provide the transportation infrastructure to make these options available. Businesses can operate vehicles with lower emissions and support commute alternatives for workers. Individuals can choose to walk, cycle, take transit, or invest in lower emission vehicles.

Current Greenhouse Gas Emissions from Transportation

Existing and Forecast GHGs from Transportation - "Business as Usual" v. Taking Action (MTCO2e)



2017 Community Vehicle Emissions by Vehicle and Fuel Type (MTCO2e)



DID YOU KNOW...

The **Chapel Hill Mobility and Connectivity Plan** sets a goal of achieving 35% bicycling, walking, and transit modeshare for commuting in Chapel Hill by 2025. This goal is in line with the 4% increase in these modes achieved between 2011 and 2015.

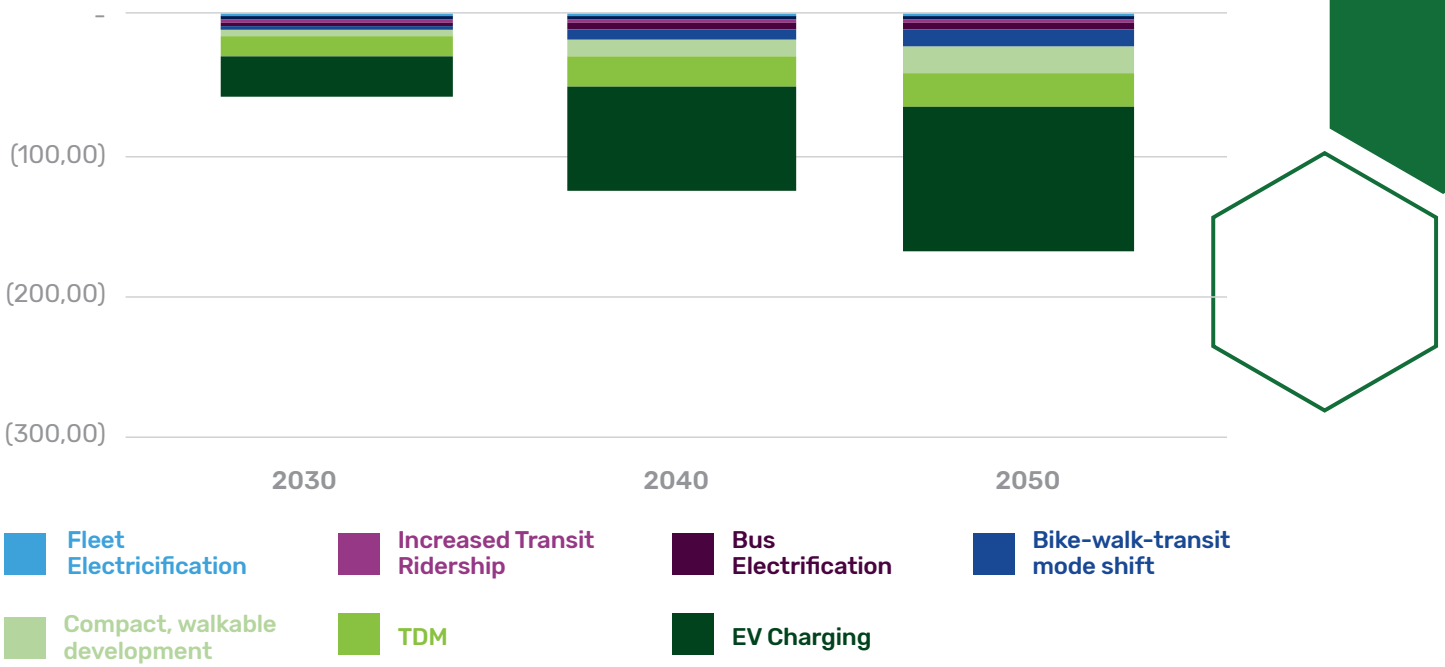
Top Transportation & Land Use Actions

TOWN GOVERNMENT ACTIONS	TOWN & COMMUNITY ACTIONS
Create walkable, bikeable, transit-served neighborhoods	Create a Town-wide Electric Vehicle (EV) charging station network
Electrify Chapel Hill Transit fleet and Town fleet	Expand TDM and plan for mobility on-demand network
Increase transit ridership and implement Bus Rapid Transit (BRT)	increase walking, biking, and transit use (mode-shift)
	Electrify private and commercial fleets

Transportation & Land Use

POTENTIAL REDUCTION IN GREENHOUSE GAS EMISSIONS

Forecast GHG Emissions Reduction Potential from Top Actions for Transportation and Land Use (MTCO2e)



Transportation & Land Use Metrics

INDICATOR	MEASURE(S)	HOW/WHY WE MEASURE
Vehicle travel	Vehicle Miles Traveled (VMT)	Reduction in VMT directly relates to transportation emissions. Compact development patterns bring housing, jobs, and other daily needs closer together, reducing VMT and offering other travel options. Data on VMT is readily available.
Pedestrian and bicycle travel	Pedestrian and bicycle counts Mode Share	Pedestrian and bicycle counts and mode share can track shifts to these modes of travel over time. Sources may include the North Carolina Non-Motorized Volume Data Program or local data
Pedestrian and bicycle facilities	Miles of bike lanes Funded projects (bike facilities, sidewalks, ADA improvements)	Implemented bicycle and pedestrian facility investments and improvements support shifts to these modes of travel over time.
Walkability	Walkscore GIS analysis	Walkability evaluation tools assess the availability of destinations and pedestrian and/or bicycle connections between them.

Climate Action Category:
Transportation & Land Use

Town's authority to act:
High-impact Action: ▼ 19,905 MTC02e

ACTION

Create Walkable, Bikeable, Transit-Served Neighborhoods

People are more likely to walk or bike when their destinations are relatively close together and when there are safe, tree-lined, interesting and comfortable places to walk or bike. Compact, walkable, bikeable development patterns can reduce vehicle travel and emissions by enabling community members to work and acquire the goods and services needed for daily life without driving, as well as promoting **healthier lifestyles**. Sustainable development includes redevelopment, **infill**, jobs and housing, parks and green spaces, as well as infrastructure for transit, bike facilities, sidewalks and other public amenities. This form of development is also a tool for advancing the goals of the Town's **Affordable Housing Plan** and providing less expensive transportation options.

Vision + Target

Create numerous walkable, mixed-use neighborhoods that are served by transit and/or connected by robust pedestrian and bicycle networks by 2050.

Strategies to advance this work over the next five years:

- Develop and implement supportive zoning and engineering standards through the rewrite of the Land Use Management Ordinance (LUMO) and related updates (e.g., reduced parking space, lot size, and building setback requirements)
- Integrate land use and transportation planning by following the vision of the recently adopted Charting Our Future land use initiative and continuing to invest in Bus Rapid Transit and the Mobility Plan
- Incentivize more compact, affordable, and mixed income housing, including "missing middle" and accessory dwelling units (ADUs)
- Create zoning and permitting incentives and proactively work with developers to achieve compact development and redevelopment that supports the vision of the Charting Our Future land use initiative
- Continue exploring options for establishing pedestrian only or car-free zones

Estimated implementation cost

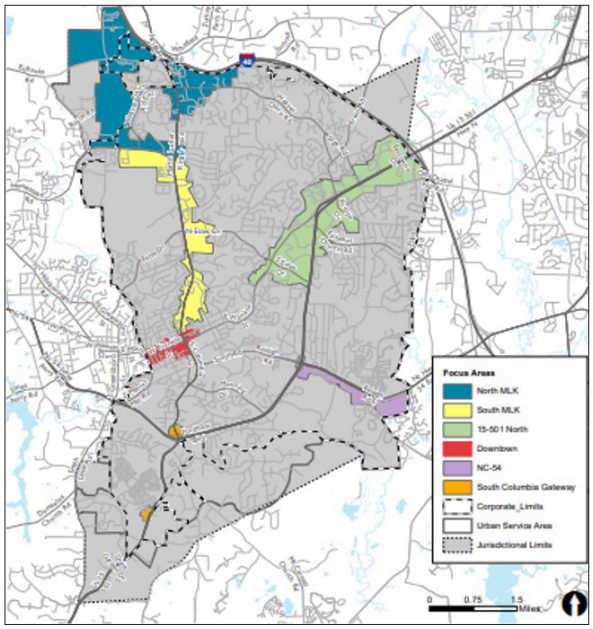
Exact costs of the LUMO rewrite and other strategies listed above are TBD.

WHAT IS THE TOWN DOING?

The Town has a history of growth management policy that limits the extension of water and sewer services and protects rural areas from the impacts of larger-scale subdivisions and other suburban forms of development. To complement these efforts, recently the Town has experimented with zoning strategies to encourage compact, walkable redevelopment of suburban commercial areas, and is currently updating its land use regulations which are often referred to as the "LUMO" or the Land Use Management Ordinance. This update can implement many of the strategies listed for creating compact, walkable, bikeable, transit-served development.

ACTION

Create Walkable, Bikeable, Transit-Served Neighborhoods



DID YOU KNOW...

A 2018 study published in the Journal of Urban Planning showed that local policy to increase urban infill had among the highest potential for GHG reduction in Berkeley, Santa Monica, Davis and some other mid-sized California cities with major colleges and universities.

This map from the Charting Our Future land use initiative shows the areas of Chapel Hill that are best suited to support more compact, walkable, bikeable, transit-served neighborhoods.

PROJECTED EMISSIONS REDUCTION (MTC02E)	2030: 5,616	2040: 13,544	2050: 19,905

OTHER BENEFITS

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+	+	+	+
Potential Impacts	+ Increased physical activity levels + Improved air quality	+ Improved neighborhood cohesion + More affordable housing opportunities	+ Jobs for green builders and construction companies	+ Improves access to community services and resources + Ability to get around during fuel disruptions	+ Regional greenways and trail linkages + Enhanced bike/ped connections to regional transit service

Legend

+ Positive ○ Neutral — Negative

Climate Action Category:
Transportation & Land Use

Town's authority to act:
High-impact Action: ▼ 12,505 MTC02e

ACTION

Increase bicycling, walking, and transit use (mode shift)

Walking and cycling are zero-emission transportation options that also promote **public health**. People choose transportation that is safe, convenient, reliable, and accessible—including mobility for people with disabilities. When facilities for walking and biking are limited or perceived as unsafe, people are less likely to walk or ride a bike. Providing alternatives to driving is critical if we want people to **drive less**.

Transit moves more people in fewer vehicles, resulting in lower emissions than driving alone. Transit riders may also combine their ride with walking or biking. Replacing the "driving alone" trips with a combination of walking, biking, and transit—and even scootering—leads to reduced emissions and a healthier community.

Vision + Target

Continue shifts to walking, biking, and transit commutes that reach levels of 35% or greater by 2050. Fully implement the Town Mobility Plan by 2035.

Strategies to advance this work over the next five years:

- Continue designing and investing in multi-modal facilities as shown in the Town's Mobility Plan
- Prepare shovel-ready projects for the anticipated Federal stimulus "Infrastructure bill"
- Develop zoning and permitting incentives to facilitate the construction of multi-modal facilities including trails, greenways, sidewalks, and bike lanes
- Develop a Wayfinding Strategy as called for in the Mobility Plan
- Experiment with ways to promote greenways and trails as travel corridors for things like commuting to work or shopping
- Continue planning for a robust, well-connected network of trails, greenways, sidewalks, and bike lanes
- Continue planning for a well-connected and convenient transit network

WHAT IS THE TOWN ALREADY DOING?

The Town has completed more than 23 miles of greenways and trails and has plans to keep going. Our Mobility Plan has a goal for 35% of all commuters to bike, walk, and ride transit to work by 2025, up from 27% in 2015.

Estimated implementation cost

Costs vary by project for nearly 100 projects in the Mobility Plan, with some funded with federal, NCDOT and Town funding; others funded by Town Capital Improvement Program only

ACTION

Increase walking, biking and transit use (mode-shift)

DID YOU KNOW...

The Town's Mobility Plan envisions a future transportation network for bicyclists, pedestrians and transit riders that safely links neighborhoods, parks, employment centers, transit stops, and other destinations.

PROJECTED EMISSIONS REDUCTION (MTC02E)	2030: 2.404	2040: 7,202	2050: 17,505

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+	+	+	+
Potential Impacts	+ Increased physical activity levels + Improved air quality	+ Decreased transportation costs + Better connectivity for all transportation modes + More transportation choices available	+ Jobs in transportation construction	+ Reduced dependencies on fossil fuels + Ability to get around during fuel disruptions	+ Regional trail linkages + Enhanced bike/ped connections to regional transit service + Regional transit linkages

Legend

+ Positive ○ Neutral — Negative

Climate Action Category:
Transportation & Land Use

Town's authority to act:
GHG Reduction ▼ 803 MTC02e

ACTION

Electrify the Municipal Fleet

The Town operates a fleet of vehicles to support the services it provides. Transitioning our fleet to more sustainable vehicle types is an important way for the Town to reduce our emissions. The Town has already made progress with moving towards alternative fuels, but a full transition to electric vehicles is the next step in achieving significant reductions. While improvements in **smart grid** technology will lessen the impacts of power outages in the future, the transition to EVs must include resiliency measures like on-site renewable energy and **battery storage**.

Vision + Target

Electrify all Town fleet passenger vehicles, light and medium duty trucks by 2040, and all heavy duty vehicles by 2050.

Strategies to advance this work over the next five years:

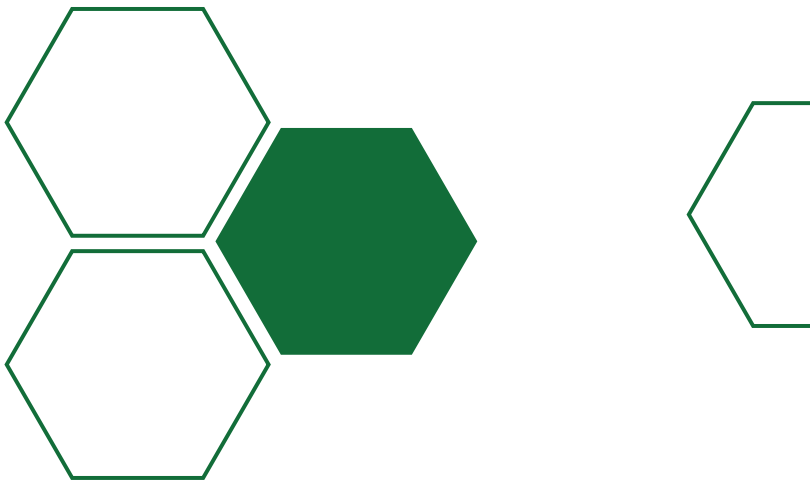
- Become an active member of the Electrification Coalition
- Evaluate a more accelerated fleet replacement program using Electrification Coalition toolkit and set new 5-year targets for 2035–2050
- Pursue grant funding to pilot EV transitions within Town departments and divisions (e.g., DERA, VW Settlement)
- Continue purchasing electric vehicles as the fleet expands or turns over
- Prioritize replacement of higher emissions vehicles with zero or low emissions vehicles

WHAT IS THE TOWN ALREADY DOING?

The Town's fleet currently operates at 15% lower annual emissions than it did in 2005 because the Town has invested in fuel efficient vehicles and low-carbon fuels like biodiesel, E85, and electricity. In 2016, the Triangle Clean Cities Coalition recognized the Town with a Champion Level NC Smart Fleet designation.

Estimated implementation cost

To convert 48 passenger and light duty vehicles by 2030, we estimate an added upfront cost of $10,000 per vehicle or a total of $480k over conventional vehicle purchases. Note: This assumes (1) other resources are available for vehicle replacement, and (2) that the total cost of ownership for an EV will be the same or cheaper than a conventional vehicle because EVs generate fuel and maintenance savings that offset their additional upfront costs.



ACTION

Electrify the Municipal Fleet

The Town is actively pursuing grant funding from the U.S. Environmental Protection Agency (EPA) to replace and begin testing all-electric garbage trucks.

DID YOU KNOW...

Initial modeling for a transition to EVs included a switch of all passenger and light duty trucks as they are scheduled to come up for replacement through 2040. Over the next year, the Town will take a closer look at ways to accelerate this work, which could eventually increase the projected emissions benefits by more than six times the values shown in the table.

PROJECTED EMISSIONS REDUCTION (MTC02E)	2030: 176	2040: 735	2050: 803

OTHER BENEFITS

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+	+	+	○
Potential Impacts	+ Improved air quality	+ Improved environmental conditions	+ Jobs for EV charging station installers	+ Reduced dependence on fossil fuels	

Legend

+ Positive ○ Neutral — Negative

Climate Action Category:
Transportation & Land Use

Town's authority to act: ●
GHG Reduction: ▼ **4,572 MTC02e**

ACTION

Electrify the Transit Fleet (Solar and Battery Backup)

Increasing transit ridership is an important strategy for reducing the number of vehicles on the roads and the associated emissions. However, this strategy is less effective if transit buses have high emissions. Electric buses can significantly reduce emissions from the transit fleet, including support vehicles. Although **smart grid technology** will help to isolate power outages near the source of disruption keeping the power on for more customers, the transition to all-electric buses and support vehicles must include resiliency measures like on-site renewable energy, **battery storage**, and **vehicle-to-building** or "V2B" technologies that can reduce building utility costs and serve as backup emergency power.

Vision + Target

Replace diesel buses and support vehicles with all-electric options over the next 20 years, replacing the oldest, least fuel efficient buses first.

Strategies to advance this work over the next five years:

- Pilot up to 10 all-electric buses by 2040
- Issue RFQ to study the potential for on-site solar and battery storage at the Transit facility
- With a successful pilot, continue purchasing Purchase electric buses and pursue grant funding where available (e.g., VW Settlement, Federal Transit Administration Low or No-Emission Program)
- Advocate for utility incentives that support fast-charging equipment and a transition to all-electric buses

WHAT IS THE TOWN ALREADY DOING?

The Town's transit fleet includes 29 hybrid-electric buses, and funding has been secured over the last few years to purchase as many as 10 new electric buses. The Town believes that electric buses are the future and will be testing and learning from the first 10 electric buses over the next few years before additional purchases are made.

Estimated implementation cost

To convert 10 additional buses by 2030, we estimate an added upfront cost of $270,000-$300,000 per bus or a total of $2.8M over conventional bus purchases. Note: This assumes (1) other resources are available for bus replacement, and (2) that the total cost of ownership for an EV bus will be the same or cheaper than a conventional bus because EVs generate fuel and maintenance savings that offset their additional upfront costs.

ACTION

Electrify the Transit Fleet (Solar and Battery Backup)

Three all-electric buses will "hit the road" in 2021, with as many as seven more scheduled to go into service by 2023.

DID YOU KNOW...

Initial modeling for a transition to all-electric buses included a switch of those scheduled to come up for replacement through 2050. Over the next year, the Town will pilot the new technology and also look at ways of accelerating this work through the support vehicle fleet.

PROJECTED EMISSIONS REDUCTION (MTC02E)	2030: 452	2040: 3,205	2050: 4,572

OTHER BENEFITS

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+	+	+	+
Potential Impacts	+ Improved air quality	+ Improved environmental conditions	+ Jobs for EV charging station installers	+ Reduced dependence on fossil fuels	+ Shared access to charging station infrastructure

Legend

+ Positive ○ Neutral — Negative

Climate Action Category:
Transportation & Land Use

Town's authority to act:
GHG Reduction: ▼ 2,305 MTC02e

ACTION

Increase Transit Ridership and Implement Bus Rapid Transit (BRT)

Increased transit ridership helps to reduce GHGs from transportation. The Town has already adopted fare-free bus service to incentivize taking transit, a climate action best practice. Expanding the availability of **fare-free** bus service should continue to increase the use of transit within our community.

One key strategy for transitioning is Bus Rapid Transit (BRT). BRT is proposed for the North-South corridor, running along Martin Luther King, Jr. Boulevard (NC Highway 86), South Columbia Street, and US 15-501 South. Implementing BRT will complement other efforts and improve transit service by increasing the ability to serve more bus riders along busy routes. Zoning that encourages compact, walkable and bikeable development and **redevelopment** along major corridors is essential to making the Town's investment in BRT as impactful as possible.

Vision + Target

Expand transit service and implement the North-South BRT corridor by 2025.

Strategies to advance the vision over the next five years:

- Continue to offer fare-free transit service
- Expand transit availability and connectivity, where possible
- Implement BRT along the North-South corridor by 2025
- Explore the feasibility of an east-west BRT concept along the 15-501 corridor

Estimated implementation cost

$200M estimated cost for two BRT corridors

WHAT IS THE TOWN ALREADY DOING?

Chapel Hill Transit provides more than 6.5 million fare-free rides per year. Since transitioning to fare-free service in 2002, it has become one of the largest fare-free systems in the United States.

WHAT IS BRT?

BRT is a strategy for transitioning single-occupancy vehicles to transit. It creates dedicated bus lanes so bus operators can bypass traffic. BRT operates similarly to light rail systems.

ACTION

Increase Transit Ridership and Implement Bus Rapid Transit (BRT)

By 2025, Chapel Hill Transit will operate Bus Rapid Transit (BRT) service from Southern Village to the Eubanks Road Park and Ride Lot at Carraway Village.

DID YOU KNOW...

Projected emissions drop slightly after 2030. This is because we have assumed that BRT will take more single occupancy vehicle car trips (those "driving alone") off the road, and that more of these car trips will be in lower polluting EVs after 2030.

PROJECTED EMISSIONS REDUCTION (MTC02E)	2030: 2,650	2040: 2,607	2050: 2,305

OTHER BENEFITS

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+	+	+	+
Potential Impacts	+ Improved air quality	+ Improved environmental conditions + Improved (fare-free) mobility	+ Jobs in transportation construction	+ Enhanced access to transit for weather emergencies and evacuation	+ Potential for working with other regional transit providers and partners

Legend

+ Positive ○ Neutral — Negative

Climate Action Category:
Transportation & Land Use

Town's authority to act:
High-impact Action: ▼ 8%

ACTION

Create a Town-wide Electric Vehicle (EV) Charging Station Network

Limited charging infrastructure can be a barrier to widespread adoption of electric vehicles (EV). Expanding charging infrastructure helps to support the purchase of and transition to EVs by making the technology easier to use and more reliable, which results in lower transportation emissions. Expanded EV charging infrastructure also supports the conversion of private and commercial fleets to electric vehicles.

Vision + Target

Create a Town-wide network of workplace and residential EV charging stations that helps to convert 50% of all community internal combustion engine vehicles to EVs by 2030 and 100% by 2050. Target investments and partnerships that deliver at least 629 public level 2, 99 public level 3 (fast charge), and 761 private level 2 charging stations by 2050.

Strategies to advance the vision over the next five years:

- Develop a plan for a Town-wide EV charging network
- Promote the benefits of electric vehicles and transition the Town fleet to all-electric vehicles by 2050
- Incentivize or require charging stations for new construction
- Streamline process and reduce barriers to installing charging stations
- Partner with commercial property owners and Duke Energy to establish more workplace and multifamily residential charging
- Work with and incentivize community partners to install public charging stations
- Install solar-powered EV charging stations, where possible
- Continue pursuing grant opportunities to install more EV charging stations on Town property

WHAT IS THE TOWN ALREADY DOING?

Chapel Hill is among North Carolina's highest-ranking cities for residents with electric vehicles. There are more than 25 publicly available charging stations, including stations managed by the Town downtown and at the Aquatic Center.

WHO WITHIN OUR COMMUNITY CAN HELP?

- Regional government partners, including the State, County, and other local governments
- UNC-CH
- Non-profits
- Energy suppliers
- EV Charging suppliers

Estimated implementation cost

$4.1M in public investment (629 Level 2 stations, 99 Level 3 stations); $1.6M in private investment (761 workplace chargers) by 2050

ACTION

Create a Town-wide Electric Vehicle (EV) Charging Station Network

DID YOU KNOW...

Today there are over 25 publicly available charging stations in Chapel Hill, like the two shown here at the Town's Aquatic Center. UNC, Duke Energy, and Piedmont Electric Memberships Corporation are essential partners in the rollout of a successful community-wide EV charging station network.

PROJECTED EMISSIONS REDUCTION (MTC02E)	2030: 29,715	2040: 74,848	2050: 107,028

OTHER BENEFITS

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+ / −	+ / ○	+	+	+
Potential Impacts	+ Improved air quality − Urban heat island effect from roadway asphalt	+ Improved environmental conditions • Location of and access to charging stations could create equity concerns if not managed	+ Jobs for EV charging station installers	+ Reduced dependence on fossil fuels	+ Opportunities to increase EV charging region-wide

Legend

+ Positive ○ Neutral − Negative

Climate Action Category:
Transportation & Land Use

Town's authority to act:
High-impact Action: ▼ 24,119 MTC02e

ACTION

Expand TDM and Plan for Mobility On-Demand Network

Transportation Demand Management (TDM) is focused on understanding how people make transportation decisions and helping them to choose alternatives to "driving alone." TDM provides support for a wide range of alternatives to driving in order to reduce the overall number of cars on the road, especially during peak travel times. By taking cars off the road, TDM can also make it easier to find parking when you do have to drive.

Transportation alternatives for TDM include transit, ridesharing, walking, bicycling, telework, and flexible or alternative work schedules. The future of TDM is "mobility on-demand"—a fully integrated network of transportation options that's designed to make any choice easy, convenient, and reliable for the traveler.

Vision + Targets

Increase the share of telework to at least 30% community-wide by 2040, and help increase the percentage of trips not taken alone in a car to 35% by 2050.

Strategies to advance the vision over the next five years:

- Continue building partnerships with employers to support telecommuting and alternative commute options
- Continue promoting and encouraging transportation alternatives
- Enhance incentives for choosing transportation options other than driving
- Explore options for creating a fully integrated mobility on-demand system in Chapel Hill

Estimated implementation cost

Some increased costs for expanded TDM program, activities, and staff

WHAT IS THE TOWN ALREADY DOING?

The Town's Commute Alternative Program offers resources and encouragement for anyone wanting to try one. "Go Chapel Hill!" has established partnerships and sponsors events to encourage commute alternatives and in 2019 received national recognition for Excellence in TDM Planning from the Association for Commuter Transportation (ACT).

WHO WITHIN OUR COMMUNITY CAN HELP?

- Employers
- Individuals
- GoTriangle vanpools and ride share matching
- GoTriangle Trip Planner

ACTION

Expand TDM and Plan for Mobility On-Demand Network

DID YOU KNOW...

Commuting can be easier and more enjoyable. What if your commute to work was also your exercise for the day? What if instead of driving alone you could catch a ride and just sit back and relax on your way to work? If you haven't already, consider taking a few minutes to learn about your other options. Visit www.gochapelhill.org to learn about your travel options.

PROJECTED EMISSIONS REDUCTION (MTCO2E)	2030: 15,570	2040: 23,393	2050: 24,119

OTHER BENEFITS

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+	○	+	+
Potential Impacts	+ Improved air quality	+ Improved environmental conditions + Possible increase in transportation options		+ Reduced dependence on fossil fuels + More travel options during disruption events	+ Collaborate to expand regional TDM efforts

Legend

+ Positive ○ Neutral — Negative

Waste, Water, & Natural Resources

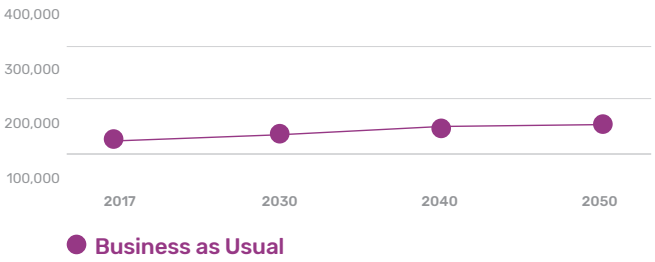
OVERVIEW

Greenhouse gas emissions come from many sources, including waste and wastewater processing, which make up about 4% of all emissions in Chapel Hill. We can do a lot of good by generating less waste and using less water. For example, 1 ton of methane emissions released from waste buried in a landfill has a greater impact on climate change than the same amount of carbon emissions. If we conserve water we also save energy and reduce emissions, so this must be a strategy for how we design our buildings and landscapes to use fewer resources.

Climate actions and responses are not limited to reducing energy use or finding cleaner sources of energy. Protecting the natural environment can help our community be more resilient to climate change. There are many ways we can work together to use our resources more wisely, to protect our natural environment, and to harness nature-based solutions to tackle climate challenges.

Current Greenhouse Gas Emissions from Waste, Water, and Other Sources

Existing and Forecast GHGs from Waste, Wastewater and Water - "Business as Usual" (MTCO2e)



TOP WASTE, WATER AND NATURAL RESOURCE ACTIONS	
TOWN GOVERNMENT ACTIONS	**TOWN & COMMUNITY ACTIONS**
Protect water quality, natural and agricultural resources	Produce zero waste

Waste, Water and Natural Resources Metrics

INDICATOR	MEASURE(S)	HOW/WHY WE MEASURE
Reduction in GHGs for waste, wastewater, etc sector	MTCO2e by sector	Meeting our GHG reduction goals requires realizing reductions in all sectors.
Solid waste diverted from landfill (recycling, composting, etc.)	Tons	Reductions in landfill waste lead to reductions in GHG.
Net acreage of stream buffers and urban forest	Acres	Buffers protect water quality, stabilize streambanks, provide and protect habitat, help maintain natural water flows, decrease flood hazards, filter pollution, and provide shade which mitigates urban heat island effects.
Net acreage of urban tree canopy coverage	Acres	Urban tree canopy provides habitat, filters pollution, and provides shade which mitigates urban heat island and encourages walking and bicycling.

Note: the chart does not include a forecast because these emissions reductions strategies have not yet been modeled.

Climate Action Category:
Waste, Water & Natural Resources

Town's authority to act:

ACTION

Produce Zero Waste

Pursuing zero waste means that we find a way to reuse all resources and that nothing is sent to the landfill. This involves reducing what we need, reusing as many items as we can, recycling only what we must, and composting the rest. On a big scale, it begins with how we obtain resources and design products and ends with how we dispose of them. A zero waste community uses the things that might otherwise be discarded because it sees today's waste as a resource that's being wasted.

Vision + Target

Produce zero waste by 2045.

Strategies to advance the vision over the next five years:

- Partner with Orange County to develop a solid waste master plan by 2024 that outlines strategies for reaching zero waste by 2045
- Explore areas of overlap for waste management and reduction with UNC-Chapel Hill
- Continue encouraging waste reduction, reuse, and compostable products for one-use items
- Expand education and awareness to residents and businesses, including the history of the Rogers and Eubanks Road Neighborhood

Estimated implementation cost

Costs TBD based on Zero Waste strategies to be implemented from the solid waste master plan

WHAT IS THE TOWN ALREADY DOING?

Orange County is leading an effort through the Solid Waste Advisory Group to develop a master plan for solid waste that includes a zero-waste goal for the community. The plan will define program costs for reaching a zero-waste goal.

WHO WITHIN OUR COMMUNITY CAN HELP?

- Waste management and related companies
- Businesses and restaurants
- Homeowners associations and neighborhood champions
- Event organizers
- Schools and universities
- Non-profits
- Individuals

DID YOU KNOW...

In partnership with Orange County, waste diversion rates reached 64% in 2014. This exceeded the 1997 goal of 61% and was in large measure due to steady increases in curbside and commercial recycling. Compostable materials still make up a large percentage of the waste stream. New goals and strategies are needed to reimagine waste as a resource.

ACTION

Produce Zero Waste

The Rogers-Eubanks neighborhood has sought environmental justice for several years, being an area previously without sewer infrastructure which was impacted by the siting of a landfill in the early 1970s. Thanks to the leadership and perseverance of Minister Robert Campbell (far left) and other residents, in 2018 the Town contributed funds to provide sewer service to the Rogers-Eubanks neighborhood. This project was made possible through a partnership between OWASA, Orange County, and the Towns of Carrboro and Chapel Hill.

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Type of Impact	+	+ / ○	+	○	+
Potential Impacts	+ Reduced waste + Reduced environmental toxins + Healthy soils support growth of healthy foods	+ Less use of resources • Communication and resource availability could affect equity of zero waste programs	+ Supports local economies + Jobs in materials reuse		+ Potential for regional zero waste and green jobs efforts

Legend

+ Positive ○ Neutral — Negative

Climate Action Category:
Waste, Water & Other

Town's authority to act:

ACTION

Protect Water Quality, Natural and Agricultural Resources

Protecting our natural environment, including conserving tree canopy and green corridors, can support our community's resilience to climate change and natural hazards. Agricultural lands provide some of the benefits of natural habitats and provide **local food** sources. High quality waters support our drinking **water supply**, protect **natural habitats**, and provide recreational opportunities. Water conservation and stormwater management are important ways to keep our water supply clean, healthy, and abundant.

Strategies to protect water quality and natural and agricultural resources over the next five years:

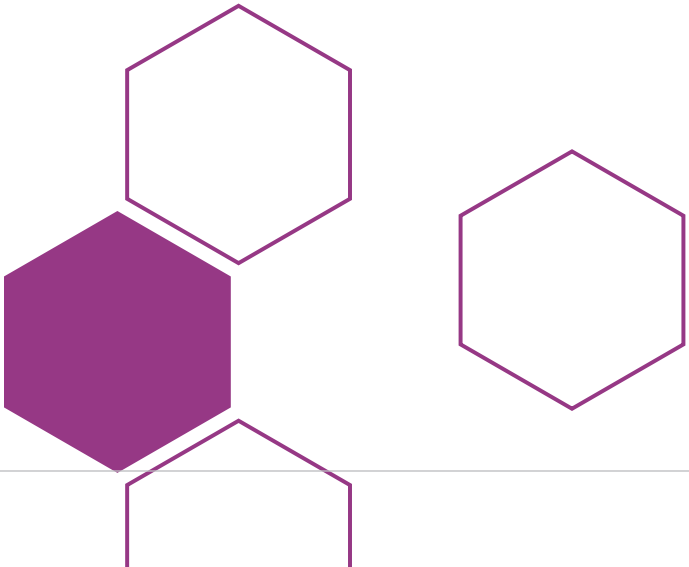
- Preserve, protect, and restore natural and agricultural lands through regulations, incentives and investment, particularly those lands and communities most impacted by natural and human-caused environmental health hazards
- Improve water quality and stormwater management by completing the Cedar Fork and Booker Headwaters subwatershed studies and implementing the top three projects across all studies by 2025
- Encourage rainwater harvesting for non-potable water demands and develop a neighborhood-focused rain barrel / rain garden program
- Promote the use of OWASA's AguaVista software to help residents and businesses monitor water usage, identify leaks, and find ways to conserve.
- Incentivize water conservation measures as part of the Town's energy upgrade program for homes and businesses
- Pilot smart city technology to enhance maintenance strategies for stormwater controls
- Partner with Orange County and the Food Council to explore ways of supporting a sustainable and equitable local food system, including Community Supported Agriculture (CSA), farmers markets, community gardens and regenerative practices
- Identify local food deserts and work with local civic organizations to develop strategies for addressing them

WHO WITHIN OUR COMMUNITY CAN HELP?

- OWASA and other municipal partners within our watersheds
- Schools and universities
- Community and civic organizations
- Homeowners associations and neighborhood champions
- Orange County Food Council and other agricultural organizations
- Businesses and business organizations
- Non-profits

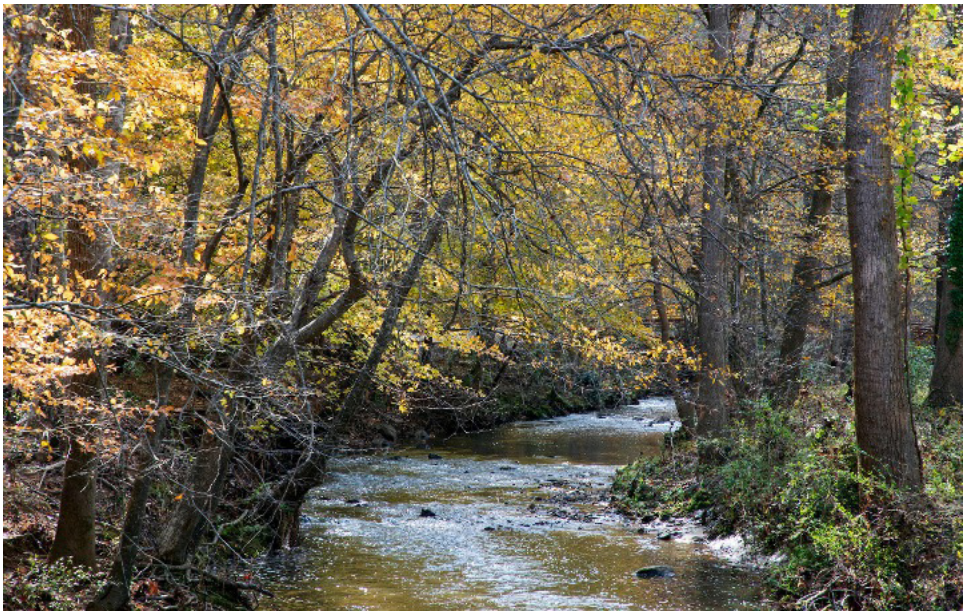
Estimated implementation cost

Costs TBD based on Town investments as identified



ACTION

Protect Water Quality, Natural and Agricultural Resources



Bolin Creek is one of Chapel Hill's most scenic waterbodies. Can you name any of the other major waterbodies in town and do you know where they go after they leave Chapel Hill?

	PUBLIC & ENVIRONMENTAL HEALTH	RACIAL EQUITY & ENVIRONMENTAL JUSTICE	JOB CREATION	RESILIENCE TO CLIMATE IMPACTS	REGIONAL PARTNERSHIPS
Level of Impact	+	+	+	+	+
Potential Impacts	+ Improved water quality + Improved access to local foods + Improved access to nature and green spaces	+ Reduced flooding risk from stormwater management	+ Jobs for environmental management, engineering, and farming	+ Increased ecosystem and habitat resilience + Reduced flooding risk	+ Potential for regional conservation efforts

Legend

+ Positive
○ Neutral
– Negative

Resiliency

OVERVIEW

Resiliency is the ability of an individual or a system such as a family, business, or community to successfully respond to disruptions and adapt to changes. Community climate resilience means that we can anticipate, prepare for, and respond to hazardous events and other consequences of a changing climate, but it's not a substitute for carbon reduction. Adapting to our changing climate and reducing the emissions that cause climate impacts are both essential parts of climate action. In combination with reducing GHGs, resilience strategies focus on adapting to the changes that we are experiencing on a local level. The strategies for building resilience include a wide range of actions, such as improving stormwater management, reducing the risk of heat impacts, building community organizational capacity, and emergency response planning. These impacts are often experienced most directly by those who contribute the least to the problem of climate change. For this reason, planning for resilience must include thinking about our residents who have higher risk levels for various threats and prioritizing their safety and wellbeing.

As communities prepare to become climate resilient, they are seizing the opportunity to build general resilience through more holistic approaches. This involves integrated resilience planning for our energy, transportation, housing, food, water, social capital, health systems and infrastructure. In this way, our community can be prepared to **"bounce forward"** by building broad general resilience rather than simply preparing to recover or **"bounce back"** from climate change impacts.

PLANNING FOR RESILIENCE AT THE REGIONAL LEVEL

The Triangle Regional Resilience Assessment (TRRA) (October 2018) was a regional effort to identify climate challenges and stressors and prioritize strategies to build resilience. The Town of Chapel Hill participated in a cooperative partnership with other communities in the region to develop the TRRA. While many of the issues can be more effectively addressed at the regional level, the TRRA shaped the Town's resilience strategies and informed the identification of stressors. In 2020, the Town added a resiliency map series to the Future Land Use Map to inform future land use decisions.

CLIMATE EQUITY

Social equity ensures all community members can access opportunities and resources necessary to meet their needs, support their wellbeing, and achieve their potential. Climate equity ensures everyone benefits from climate solutions, and no one takes on more of the burden of climate impacts. This requires intentional efforts to change the systems and structures that worsen climate change and inequality.

Top Resiliency Actions

TOWN GOVERNMENT ACTIONS	TOWN & COMMUNITY ACTIONS
Strengthen early warning systems for climate hazards and heat	Expand climate action education, outreach, and awareness
Enhance green infrastructure	Grow partnerships, funding, and incentives
	Broaden community-wide resiliency and recovery

Resiliency

Eastgate Crossing shopping center after Hurricane Florence in 2018.

DID YOU KNOW...

In 2020-21 the Town invested in the Elliot Road Flood Storage Project, a partnership with the owner of Eastgate Crossing and other nearby landowners to mitigate the effects of flooding in this area of town. The project also doubles as a "climate park", which offers passive recreation and points of connection within the Blue Hill District.

Resiliency and Recovery Metrics

INDICATOR	MEASURE(S)	HOW/WHY WE MEASURE
Time to recovery after a catastrophic event	Months	Speed of recovery after an event such as a flood or hurricane is an indicator of how resilient a community is.
Average Income	$	Higher incomes and higher diversity of income sources indicate a more resilient population with higher capacity to recover
Access to food/basic services	Percent of population and employment within 0.4 miles of transit	Transit accessibility is one way to assess whether the population is able to access food and basic services. A high degree of access means the population is more likely to be resilient to stress.
Neighborhood Cohesion	Community survey questions about things like: sense of belonging, perception of safety, getting along well with neighbors	Strong social cohesion at the neighborhood and community levels has been shown to increase access to goods and services and serve as the foundation for the ability to address and "bounce back" quickly from sudden disruptions (resiliency)

ACTION

Strengthen Early Warning Systems for Climate Hazards and Heat

Early warning systems can help people know when hazards are imminent, allowing them to appropriately prepare and respond. The Triangle Regional Resilience Assessment identified a strategy for developing flood early warning systems with gauges in strategic locations to let people know when to evacuate, as well as providing information on road closures. The Town will explore early warning systems for other hazards, like extreme heat, which would let people know when to take precautions to avoid dangerously hot and prolonged weather.

Vision + Target

Provide residents and business owners advanced warning and faster emergency response times through enhanced smart city early warning system technology by 2030.

Strategies to advance the vision over the next five years:

- Determine who in our community is most impacted by climate stressors like flooding and extreme heat
- Develop predictive tools that can anticipate flooding and the need for road closures and other responses in advance of a severe weather event
- Find ways of making data readily available to residents and business owners through mapping, apps, flood gauges, warning signs, etc.

Estimated implementation cost

Costs TBD based on systems considered

ACTION

Enhance Green Infrastructure

Green infrastructure includes things like green space, stormwater control measures, urban forest, and green building features like green walls and rooftops. This form of natural infrastructure can strengthen community resilience and provide several "ecosystem service benefits" like improving air and water quality, replenishing our groundwater, providing shade and habitat for birds and other species, and serving as recreational amenities that have positive effects on our physical and mental health.

Stormwater management "devices" like this one at Southern Community Park can help to manage and treat runoff.

Vision + Targets

Plant an average of 200 or more canopy trees every year and enact a new green infrastructure ordinance by 2022.

How can nature-based solutions help us become more resilient?

Trees and green spaces can help to mitigate heat effects. Trees provide shade, and open spaces reduce the amount of paved surfaces that increase heat. Vegetation also helps with water filtration and non-paved areas allow water to soak into the ground, reducing runoff. Green infrastructure provides critical habitat and ecosystem service benefits. As new development occurs over time, it will be critically important to balance these changes with continued investment in the protection, conservation and enhancement of our natural environment.

Estimated implementation cost

Total cost per tree to ensure survival can range from $500-$1,000. Total cost to develop a green infrastructure ordinance can range from $50,000-$75,000.

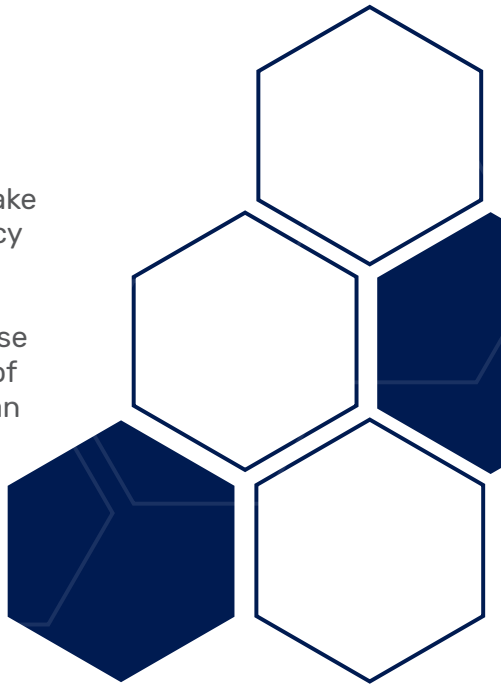
Who within our community can help?

- Chapel Hill Tree Planting Program
- Friends of Chapel Hill Parks & Recreation
- North Carolina Botanical Garden
- Downtown Partnership
- UNC

ACTION

Expand Climate Action Education, Outreach, and Awareness

Education, outreach and awareness can help equip our community to understand why climate action and response are important and how it can take action. Our community has expressed the importance of sustainability literacy for children, adults, and businesses. The Town, schools, neighborhoods, places of worship and civic organizations can work together to deliver constructive and collaborative educational programs and outreach to increase participation in climate actions. As part of this work, we will explore the role of the Chapel Hill Peoples Academy and opportunities to grow a network of "Plan Ambassadors."



Estimated implementation cost

Some increased costs for expanded sustainability and climate-related programs, activities, and staff

Potential Climate Education Topics

- Climate action in Town government (Peoples Academy)
- The importance of climate action
- Public transportation benefits
- Anti-idling
- How individual and business actions impact climate
- Economic/public health benefits and values of climate actions, including the social cost of carbon for decision-making
- Importance of transportation and land use connections to climate
- Lawn care, including the benefits of "leaving the leaves"
- Composting
- How to reduce waste and why it's important
- Recycling
- How to reduce runoff and manage water use
- Importance of stream buffers
- Rain water capture, rain gardens and stormwater
- Sharing best practices
- How to reduce runoff and manage water use
- Training for green jobs

ACTION

Grow Partnerships, Funding, and Incentives

Making progress on climate action and response as a community will require a variety of resources. Partnerships among the Town, institutions, businesses, and other local organizations are necessary for taking action together. We cannot do this alone and the problems stretch well beyond our borders. Funding sources must be identified, and climate actions should be incentivized to encourage maximum participation.

Strategies for building partnerships, securing funding, and providing incentives over the next five years:

- Strengthen partnerships for disaster response and explore disaster preparedness planning
- Declare a climate emergency to build support for funding
- Pursue mitigation grants
- Support state and regional efforts, such as the State natural and working lands action plan
- Pursue joint enabling legislation with other municipal partners
- Provide tax and zoning incentives for land preservation
- Encourage competition based on audits of building efficiency for homes and businesses
- Provide funding for retrofits and health care for people with low wealth
- Invest in and implement local watershed plans
- Partner with OWASA on expanded water conservation programming and measures

Estimated implementation cost

Cost range TBD based on specific Town activities

ACTION

Broaden Community-wide Resilience and Recovery Actions

Our community can implement a variety of strategies to improve resilience and recover from the impacts of COVID-19.

Resilience and Recovery Strategies Include:

- Collaborate with Orange County partners to develop a long-term recovery plan for COVID-19, and look for ways to keep the positives (e.g., teleworking, flexible work schedules, on-road walking and biking paths)
- Organize emergency staff and volunteers to be ready for rapid response in our community and other parts of the state
- Provide strategic power sites for public use in emergency situations
- Designate cooling centers for 100 degree days
- Advocate for moving water, residents, and groundwater threats from the floodplain
- Cooperate among town, university, and regional partners for emergency management and resilience planning

Estimated implementation cost

Cost range TBD based on specific Town activities

Implementation and Next Steps

Our Climate Action and Response Plan lays out a framework for the Town and the Chapel Hill community to take action together to meet our climate goals. Now the real work begins.

The Town Council has made climate action their top priority, committing to several key strategies already. To advance racial equity in Chapel Hill, we will work directly with frontline communities and historically marginalized groups to design and implement climate actions that are meaningful and impactful to everyone who lives here. Our goals and the key actions identified within this plan will help guide our municipal decision-making, weighing factors like the social cost of carbon and the long-term impacts to residents most at risk.

The planning process set the foundation for future partnerships among the Town, businesses, institutions, and civic organizations across Chapel Hill. We must continue to strengthen these relationships and work together toward our shared climate goals. We have the knowledge, relationships, and tools we need to advance and support climate actions throughout our community. Now it's up to all of us to stay committed, work together, and put our ideas into action. We will lead the way.

Following the adoption of this plan, we will develop further funding options and a detailed implementation plan that provides more information about things like project scope, cost, timing, project duration, staffing resources, and Town authority. We will provide annual updates to Council and make any necessary adjustments along the way. Let's get going.

Glossary of Terms

Building Code refers to the set of rules for how buildings must be constructed in our state.

Carbon emissions reduction, also called climate mitigation or greenhouse gas emissions reduction, refers to any activity that reduces the greenhouse gas emissions that cause climate change (e.g., walking instead of driving, turning on a room fan instead of lowering the temperature of the entire living space).

Carbon footprint means the amount of greenhouse gas emissions caused by a person or organization's activities over a period of time, typically one year. Common activities include driving, heating or cooling a home, washing clothes, etc.

Charging stations provide the electricity that charges the battery inside of electric vehicles.

Charting Our Future is a land use initiative which has created a Council-adopted vision for how Chapel Hill will grow and evolve between now and 2050. This Council's vision outlines strategies and goals for future land use and development and will serve as the foundation for decision-making so that the Town's land use tools are predictable, functional, and intentional.

Clean energy comes from renewable sources like the sun, wind, water and earth.

Climate action is any activity that reduces our greenhouse gas emissions, or that helps us respond to our changing climate by making Chapel Hill a stronger and more resilient community.

Climate adaptation is the process of adjusting to new climate-caused conditions in order to lower risks to people and property (e.g., using less water under times of drought).

Climate change refers to long-term changes to weather patterns, such as a place becoming generally hotter, colder, drier, or wetter over time. In recent decades, climate change has occurred at an unprecedented rate primarily due to greenhouse gas emissions from human activity. This human impact on the environment is evident in the increasingly unpredictable and destructive weather patterns that negatively affect our community.

Climate equity means that climate action is designed to strengthen the capabilities of residents who are most impacted by climate change.

Composting is a process that turns vegetable food scraps and other plant materials into soil. Composting reduces harmful emissions that are otherwise released in landfills.

Early warning systems use sensors and other technology to alert us to hazardous conditions so that we can get people out of harm's way.

Ecosystem services are benefits that humans receive from natural systems (e.g., food, filtering of air and water, recreation).

Electric vehicles are cars, trucks and other vehicles that run on electricity and produce zero tailpipe emissions in this mode.

Energy burden is when more than 6% of household income is spent on energy bills.

Energy efficiency upgrades are improvements to a building that lower its energy use.

Energy saving kits include things like energy efficient lightbulbs and insulation.

Environmental Justice means all people and communities have the right to equal environmental protection under the law, and the right to live, work and play in communities that are safe, healthy and free of life-threatening conditions (Columbia University).

Environmental Racism means whether, by conscious design or institutional neglect, actions and decisions that result in the disproportionate exposure of people of color to environmental hazards and environmental health burdens (Columbia University).

Flood storage ponds are used to capture and hold rainwater to reduce flooding in low-lying areas.

Food desert refers to areas within communities where residents have limited access to healthy and affordable food.

Food system refers to the activities associated with the production, processing, transportation, and consumption of food and is sometimes called "farm to fork." Food system sustainability issues include things like access to healthy and affordable foods, impacts on the natural environment, and food waste.

Food waste is food that is wasted, lost, or uneaten.

Frontline or climate vulnerable communities are those most at risk of being exposed to the impacts of climate change (e.g., flooding, extreme temperatures).

Geothermal heat pumps use the constant temperature of the earth to reduce the amount of energy needed to heat and cool buildings.

Green banks are financial institutions that specialize in funding to increase the use of clean energy technologies and infrastructure.

Green building refers to a form of design and construction that aims to reduce our impacts on the natural environment and conserve natural resources.

Green building strategies include the use of: cool roofs (white or vegetated); effective insulation and quality, efficient building materials; more efficient plumbing fixtures, heating and cooling systems, and appliances; orienting the building to use natural heating, cooling, and daylight when possible; siting the building near transit or other travel options; recycling and minimizing construction waste; incorporating recycled, reclaimed, or sustainable materials; utilizing innovative and sustainable designs like mass/tall timber construction; native and water-efficient, drought resistant landscaping; and incentives such as fee waivers, tax rebates, low-cost loans, expedited permitting, recognition programs.

Green building strategies include: creating cool roofs (white or vegetated); effective insulation and quality, efficient building materials; more efficient plumbing fixtures, heating and cooling systems, and appliances; orienting the building to use natural heating, cooling, and daylight when possible; siting the building near transit or other travel options; recycling and minimizing construction waste; incorporating recycled, reclaimed, or sustainable materials; utilizing innovative and sustainable designs like mass/tall timber construction; native and water-efficient, drought resistant landscaping; and incentives such as fee waivers, tax rebates, low-cost loans, expedited permitting, recognition programs.

Green infrastructure includes things like green space, stormwater control measures, urban forest, and green buildings.

Greenhouse Gas Emissions (GHGs) are gases in the earth's atmosphere that trap heat and warm the planet. GHGs include carbon dioxide, methane, nitrous oxide, and fluorinated gases. The right proportion of GHGs keep our planet warm enough to support life. When there are too many GHGs in our atmosphere, too much heat is trapped and overall temperature rises. Human activity such as burning fossil fuels has caused a dramatic increase in these gases since around 1900, and the trend has rapidly accelerated in recent years. GHGs are sometimes described as "carbon emissions" or a person's "carbon footprint". Carbon dioxide is the main greenhouse gas produced by human activities.

"Green the grid" means working with and supporting utilities like Duke Energy and Dominion as they replace fossil fuel burning power plants that use coal and natural gas with renewable energy sources like solar and wind farms, which also use batteries to help store the energy so that it can be provided 24 hours a day.

High-impact actions are those that are projected to reduce GHGs equal to or greater than the annual amount of emissions generated by Town government operations (12,378 MTCO2e).

Infrastructure includes things like streets, bridges, pipes, power lines, internet cables, etc.

Living walls and roofs are surfaces of a building where plants grow. These green areas reduce the

amount of heat that a building will give off, lowering the temperature around it.

Micromobility describes a variety of small and lightweight (under 1,100 pounds) vehicles like bikes, shared bikes, electric-assist bikes, electric skateboards and scooters. Micromobility is an important and growing transportation field because it can replace the majority of car trips that are under 5 miles, especially where there are safe and well-connected greenways, trails, bike lanes and other dedicated infrastructure.

Missing middle housing refers to a range of clustered houses and smaller multifamily buildings that fill in the "middle" between traditional single family homes and larger multifamily apartments. These housing products provide a community with an essential mix of building types that increase housing affordability and choice. The concept of a "missing middle" suggests that there are not enough of these housing products on the market.

Mobility on demand is a fully integrated transportation system that puts the "traveler first" by allowing them to easily move between different transportation options like bus, bike, car and rail. Integration involves the coordination of schedules, payment systems, and ride availability among different transportation service providers, both public and private.

Mobility Plan refers to a Town-adopted plan that envisions a transportation network for bicyclists, pedestrians and transit riders that safely links neighborhoods, parks, employment centers, transit stops, and other destinations. The goal of the Plan is for 35% of all commuters to bike, walk and ride transit to work by 2025.

Net-zero emissions means achieving a balance between activities that create GHG emissions with those that remove them from the atmosphere. Another term for net-zero emissions is "carbon neutral." Today, reaching net-zero emissions often requires the use of renewable energy to offset any GHG emissions that cannot be eliminated (e.g., adding solar panels to the roof of a house to offset the use of utility electricity that is generated using coal or other fossil fuels).

Property assessed clean energy or PACE is a financing tool that helps homeowners and businesses to invest in energy efficiency and renewable energy projects that can be paid back through annual property taxes which run with the property.

Purchased clean energy, also called "carbon offsets", is energy made from renewable sources like solar and wind. This energy is often purchased by organizations when clean energy is unavailable or difficult to produce.

Rainwater collection is the process of capturing and storing rainwater in a natural area or tank.

Rainwater reuse is taking the captured rainwater and using it to do things like water a garden. This helps lower the amount of clean drinking water that is used for non-drinking purposes.

Resilience is the ability of an individual or a system such as a family, business, or community to successfully respond to disruptions and adapt to changes.

Sewage treatment is the process of cleaning our sewage (or wastewater) so that it can be returned to Morgan Creek, which flows into Jordan Lake. OWASA does this for our community.

Social cost of carbon represents the economic harm caused to people by one ton of greenhouse gas emissions. The value of avoiding this impact is currently estimated at over $50 per ton (Environmental Defense Fund). In addition to cost savings from lower utility bills or other operational adjustments, the social cost of carbon can be used to determine the total value of any project designed to reduce greenhouse gas emissions.

Solar panels capture sunlight to make electricity.

Solar farms are large installations of solar panels that are mounted on the ground.

Solar hot water systems capture sunlight and use the heat to create hot water.

Stream buffers or riparian buffers are the natural areas located on either side of a stream. Stream buffers protect water quality (including drinking water), stabilize streambanks, provide and protect aquatic and terrestrial habitat, help maintain natural hydrology (groundwater infiltration, maintain streamflow), prevent flooding, filter pollution, provide shade which mitigates urban heat island effects and provide other "ecosystem services" (see definition above).

Total cost of ownership or "TCO" refers to all of the expenses associated with owning an asset like a vehicle or building. When it comes to investments in energy efficiency, a TCO analysis can show how a more energy efficient option helps you recoup your added costs and save money over time compared to cheaper, less efficient investments that cost more to operate and maintain (e.g., electric vehicle vs. conventional gas-powered vehicle).

Transportation Demand Management is focused on helping people make decisions about how they can travel in ways that use low-carbon transportation options and reduce traffic congestion, lowering the need for building new roads and travel lanes. TDM travel options include things like: transit, ridesharing, biking, walking and teleworking.

Utility integrated resource plans or "IRPs" are approved by the North Carolina Utilities Commission and chart a course for the types of resources a utility will use to generate electricity over a 15-20 year period in order to meet the needs of their customers. IRP reviews are an opportunity for local governments and other interested parties to work with utilities to develop plans that support climate action goals. Topics include things like affordability and access to electricity, renewable energy, energy efficiency, electric vehicle infrastructure, and smart grid technology.

Water treatment is the process of taking water from our reservoirs, like University Lake and Cane Creek, and producing clean drinking water that can be sent to people's homes and businesses.

Zero waste refers to the idea that we find a way to reuse all resources and that nothing is sent to the landfill. This involves reducing what we need, reusing as many items as we can, recycling only what we must, and composting the rest.

Appendix

The following documents provide additional details and information about the calculations, assumptions, and research used to develop this plan. These documents can be found at www.sustainchapelhill.org. Following the adoption of this plan, this document will be integrated within the Town's website so that new information and points of connection for advisory boards, residents, businesses and other organizations are more easily accessible over time.

Greenhouse Gas Emissions Inventory and Forecast Report

Community Greenhouse Gas Emissions Inventory and Forecast Calculations

Municipal Greenhouse Gas Emissions Inventory and Forecast Calculations

Carbon Reduction Measures Report

Chapel Hill Greenhouse Gas Emissions Reduction Measures Calculations

SUSTAINABILITY
Climate Action Plan

Article 7.

Zoning Regulation.

§ 160D-701. Purposes.

Zoning regulations shall be made in accordance with a comprehensive plan and shall be designed to promote the public health, safety, and general welfare. To that end, the regulations may address, among other things, the following public purposes: to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; to lessen congestion in the streets; to secure safety from fire, panic, and dangers; to facilitate the efficient and adequate provision of transportation, water, sewerage, schools, parks, and other public requirements; and to promote the health, safety, morals, or general welfare of the community. The regulations shall be made with reasonable consideration, among other things, as to the character of the district and its peculiar suitability for particular uses and with a view to conserving the value of buildings and encouraging the most appropriate use of land throughout the local government's planning and development regulation jurisdiction. The regulations may not include, as a basis for denying a zoning or rezoning request from a school, the level of service of a road facility or facilities abutting the school or proximately located to the school. (2019-111, s. 2.4; 2020-3, s. 4.33(a); 2020-25, s. 51(a), (b), (d).)

§ 160D-702. Grant of power.

(a) A local government may adopt zoning regulations. Except as provided in subsections (b) and (c) of this section, a zoning regulation may regulate and restrict the height, number of stories, and size of buildings and other structures; the percentage of lots that may be occupied; the size of yards, courts, and other open spaces; the density of population; the location and use of buildings, structures, and land. A local government may regulate development, including floating homes, over estuarine waters and over lands covered by navigable waters owned by the State pursuant to G.S. 146-12. A zoning regulation shall provide density credits or severable development rights for dedicated rights-of-way pursuant to G.S. 136-66.10 or G.S. 136-66.11. Where appropriate, a zoning regulation may include requirements that street and utility rights-of-way be dedicated to the public, that provision be made of recreational space and facilities, and that performance guarantees be provided, all to the same extent and with the same limitations as provided for in G.S. 160D-804 and G.S. 160D-804.1.

(b) Any regulation relating to building design elements adopted under this Chapter may not be applied to any structures subject to regulation under the North Carolina Residential Code for One- and Two-Family Dwellings except under one or more of the following circumstances:

(1) The structures are located in an area designated as a local historic district pursuant to Part 4 of Article 9 of this Chapter.

(2) The structures are located in an area designated as a historic district on the National Register of Historic Places.

(3) The structures are individually designated as local, State, or national historic landmarks.

(4) The regulations are directly and substantially related to the requirements of applicable safety codes adopted under G.S. 143-138.

(5) Where the regulations are applied to manufactured housing in a manner consistent with G.S. 160D-908 and federal law.

(6) Where the regulations are adopted as a condition of participation in the National Flood Insurance Program.

Regulations prohibited by this subsection may not be applied, directly or indirectly, in any zoning district or conditional district unless voluntarily consented to by the owners of all the property to which those regulations may be applied as part of and in the course of the process of seeking and obtaining a zoning amendment or a zoning, subdivision, or development approval, nor may any such regulations be applied indirectly as part of a review pursuant to G.S. 160D-604 or G.S. 160D-605 of any proposed zoning amendment for consistency with an adopted comprehensive plan or other applicable officially adopted plan.

For the purposes of this subsection, the phrase "building design elements" means exterior building color; type or style of exterior cladding material; style or materials of roof structures or porches; exterior nonstructural architectural ornamentation; location or architectural styling of windows and doors, including garage doors; the number and types of rooms; and the interior layout of rooms. The phrase "building design elements" does not include any of the following: (i) the height, bulk, orientation, or location of a structure on a zoning lot, (ii) the use of buffering or screening to minimize visual impacts, to mitigate the impacts of light and noise, or to protect the privacy of neighbors, or (iii) regulations adopted pursuant to this Article governing the permitted uses of land or structures subject to the North Carolina Residential Code for One- and Two-Family Dwellings.

Nothing in this subsection affects the validity or enforceability of private covenants or other contractual agreements among property owners relating to building design elements.

(c) A zoning or other development regulation shall not do any of the following:

(1) Set a minimum square footage of any structures subject to regulation under the North Carolina Residential Code for One- and Two-Family Dwellings.

(2) Set a maximum parking space size larger than 9 feet wide by 20 feet long unless the parking space is designated for handicap, parallel, or diagonal parking. (2019-111, s. 2.4; 2020-3, s. 4.33(a); 2020-25, ss. 15, 51(a), (b), (d); 2022-11, s. 10(a).)

§ 160D-703. Zoning districts.

(a) Types of Zoning Districts. – A local government may divide its territorial jurisdiction into zoning districts of any number, shape, and area deemed best suited to carry out the purposes of this Article. Within those districts, it may regulate and restrict the erection, construction, reconstruction, alteration, repair, or use of buildings, structures, or land. Zoning districts may include, but are not be limited to, the following:

(1) Conventional districts, in which a variety of uses are allowed as permitted uses or uses by right and that may also include uses permitted only with a special use permit.

(2) Conditional districts, in which site plans or individualized development conditions are imposed.

(3) Form-based districts, or development form controls, that address the physical form, mass, and density of structures, public spaces, and streetscapes.

(4) Overlay districts, in which different requirements are imposed on certain properties within one or more underlying conventional, conditional, or form-based districts.

(5) Districts allowed by charter.

(b) Conditional Districts. – Property may be placed in a conditional district only in response to a petition by all owners of the property to be included. Specific conditions may be

proposed by the petitioner or the local government or its agencies, but only those conditions approved by the local government and consented to by the petitioner in writing may be incorporated into the zoning regulations. Unless consented to by the petitioner in writing, in the exercise of the authority granted by this section, a local government may not require, enforce, or incorporate into the zoning regulations any condition or requirement not authorized by otherwise applicable law, including, without limitation, taxes, impact fees, building design elements within the scope of G.S. 160D-702(b), driveway-related improvements in excess of those allowed in G.S. 136-18(29) and G.S. 160A-307, or other unauthorized limitations on the development or use of land. Conditions and site-specific standards imposed in a conditional district shall be limited to those that address the conformance of the development and use of the site to local government ordinances, plans adopted pursuant to G.S. 160D-501, or the impacts reasonably expected to be generated by the development or use of the site. The zoning regulation may provide that defined minor modifications in conditional district standards that do not involve a change in uses permitted or the density of overall development permitted may be reviewed and approved administratively. Any other modification of the conditions and standards in a conditional district shall follow the same process for approval as are applicable to zoning map amendments. If multiple parcels of land are subject to a conditional zoning, the owners of individual parcels may apply for modification of the conditions so long as the modification would not result in other properties failing to meet the terms of the conditions. Any modifications approved apply only to those properties whose owners petition for the modification.

(b1) Limitations. – For parcels where multifamily structures are an allowable use, a local government may not impose a harmony requirement for permit approval if the development contains affordable housing units for families or individuals with incomes below eighty percent (80%) of the area median income.

(c) Uniformity Within Districts. – Except as authorized by the foregoing, all regulations shall be uniform for each class or kind of building throughout each district but the regulations in one district may differ from those in other districts.

(d) Standards Applicable Regardless of District. – A zoning regulation or unified development ordinance may also include development standards that apply uniformly jurisdiction-wide rather than being applicable only in particular zoning districts. (2019-111, s. 2.4; 2020-3, s. 4.33(a); 2020-25, ss. 16, 50(b), 51(a), (b), (d); 2021-180, s. 5.16(a).)

§ 160D-704. Incentives.

(a) For the purpose of reducing the amount of energy consumption by new development, a local government may adopt ordinances to grant a density bonus, make adjustments to otherwise applicable development requirements, or provide other incentives within its planning and development regulation jurisdiction, if the person receiving the incentives agrees to construct new development or reconstruct existing development in a manner that the local government determines, based on generally recognized standards established for such purposes, makes a significant contribution to the reduction of energy consumption and increased use of sustainable design principles.

(b) In order to encourage construction that uses sustainable design principles and to improve energy efficiency in buildings, a local government may charge reduced building permit fees or provide partial rebates of building permit fees for buildings that are constructed or renovated using design principles that conform to or exceed one or more of the following certifications or ratings:

(1) Leadership in Energy and Environmental Design (LEED) certification or higher rating under certification standards adopted by the U.S. Green Building Council.
(2) A One Globe or higher rating under the Green Globes program standards adopted by the Green Building Initiative.
(3) A certification or rating by another nationally recognized certification or rating system that is equivalent or greater than those listed in subdivisions (1) and (2) of this subsection. (2019-111, s. 2.4; 2020-3, s. 4.33(a); 2020-25, s. 51(a), (b), (d).)

§ 160D-705. Quasi-judicial zoning decisions.

(a) Provisions of Ordinance. – The zoning or unified development ordinance may provide that the board of adjustment, planning board, or governing board hear and decide quasi-judicial zoning decisions. The board shall follow quasi-judicial procedures as specified in G.S. 160D-406 when making any quasi-judicial decision.

(b) Appeals. – Except as otherwise provided by this Chapter, the board of adjustment shall hear and decide appeals from administrative decisions regarding administration and enforcement of the zoning regulation or unified development ordinance and may hear appeals arising out of any other ordinance that regulates land use or development. The provisions of G.S. 160D-405 and G.S. 160D-406 are applicable to these appeals.

(c) Special Use Permits. – The regulations may provide that the board of adjustment, planning board, or governing board hear and decide special use permits in accordance with principles, conditions, safeguards, and procedures specified in the regulations. Reasonable and appropriate conditions and safeguards may be imposed upon these permits. Where appropriate, such conditions may include requirements that street and utility rights-of-way be dedicated to the public and that provision be made for recreational space and facilities. Conditions and safeguards imposed under this subsection shall not include requirements for which the local government does not have authority under statute to regulate nor requirements for which the courts have held to be unenforceable if imposed directly by the local government, including, without limitation, taxes, impact fees, building design elements within the scope of G.S. 160D-702(b), driveway-related improvements in excess of those allowed in G.S. 136-18(29) and G.S. 160A-307, or other unauthorized limitations on the development or use of land.

The regulations may provide that defined minor modifications to special use permits that do not involve a change in uses permitted or the density of overall development permitted may be reviewed and approved administratively. Any other modification or revocation of a special use permit shall follow the same process for approval as is applicable to the approval of a special use permit. If multiple parcels of land are subject to a special use permit, the owners of individual parcels may apply for permit modification so long as the modification would not result in other properties failing to meet the terms of the special use permit or regulations. Any modifications approved apply only to those properties whose owners apply for the modification. The regulation may require that special use permits be recorded with the register of deeds.

(d) Variances. – When unnecessary hardships would result from carrying out the strict letter of a zoning regulation, the board of adjustment shall vary any of the provisions of the zoning regulation upon a showing of all of the following:

(1) Unnecessary hardship would result from the strict application of the regulation. It is not necessary to demonstrate that, in the absence of the variance, no reasonable use can be made of the property.

(2) The hardship results from conditions that are peculiar to the property, such as location, size, or topography. Hardships resulting from personal circumstances, as well as hardships resulting from conditions that are common to the neighborhood or the general public, may not be the basis for granting a variance. A variance may be granted when necessary and appropriate to make a reasonable accommodation under the Federal Fair Housing Act for a person with a disability.

(3) The hardship did not result from actions taken by the applicant or the property owner. The act of purchasing property with knowledge that circumstances exist that may justify the granting of a variance is not a self-created hardship.

(4) The requested variance is consistent with the spirit, purpose, and intent of the regulation, such that public safety is secured and substantial justice is achieved.

No change in permitted uses may be authorized by variance. Appropriate conditions may be imposed on any variance, provided that the conditions are reasonably related to the variance. Any other development regulation that regulates land use or development may provide for variances from the provisions of those ordinances consistent with the provisions of this subsection. (2019-111, s. 2.4; 2020-3, s. 4.33(a); 2020-25, ss. 17, 50(b), 51(a), (b), (d).)

§ 160D-706. Zoning conflicts with other development standards.

(a) Unless otherwise prohibited by G.S. 160A-174(b), when regulations made under authority of this Article require a greater width or size of yards or courts, or require a lower height of a building or fewer number of stories, or require a greater percentage of a lot to be left unoccupied, or impose other higher standards than are required in any other statute or local ordinance or regulation, the regulations made under authority of this Article govern. Unless otherwise prohibited by G.S. 160A-174(b), when the provisions of any other statute or local ordinance or regulation require a greater width or size of yards or courts, or require a lower height of a building or a fewer number of stories, or require a greater percentage of a lot to be left unoccupied, or impose other higher standards than are required by the regulations made under authority of this Article, the provisions of that statute or local ordinance or regulation govern.

(b) When adopting regulations under this Article, a local government may not use a definition of building, dwelling, dwelling unit, bedroom, or sleeping unit that is inconsistent with any definition of those terms in another statute or in a rule adopted by a State agency, including the State Building Code Council. (2019-111, s. 2.4; 2020-3, s. 4.33(a); 2020-25, ss. 18, 50(b), 51(a), (b), (d); 2021-168, s. 2(a); 2022-11, s. 17(a); 2022-46, s. 27; 2022-62, s. 61.)

Chapel Hill Town Council – June 2023 – Ann Rogers

I fully understand that Chapel Hill will expand and continue with development, but know that it should be accomplished in a well-thought-out and sensible manner. It makes sense for the acreage north of Old Chapel Hill Road to be developed, since it is fairly well separated from most existing homes, and is adjacent to major roads. Why not start with development in that area which is already consistent with the FLUM? But, to ignore the FLUM, which so much money and time went into, and to change the zoning of the Huse Street area is absurd and irresponsible! The Huse Street plot should NOT become another densely-developed area that is crammed right beside many lovely single-family homes, and the town should NOT approve a plan that does not fit in with the surrounding neighborhood. The developer is proposing a 7-story building at the corner, which will tower over this entire section of town! That is even taller than the 5-story buildings already being built at the Fordham end of Ephesus Church Road! **You should all go look at those new apartments, and envision a building on our corner that is almost 50% taller.**

Another huge concern is the quality and stability of Clark Lake, which I have lived on for almost 50 years.. Our lake already struggles with excessive runoff when we have a good rainstorm, and my yard already floods during fairly heavy rains. And, it's only going to get worse if you allow the corner of Pope and Old Chapel Hill Roads to be cleared. The integrity of our dam will be in question, and the homeowners here are not equipped financially to repair the earthen dam. This lake is an asset to Chapel Hill, both in stormwater collection and as a walking path for surrounding neighborhoods, and a large development upstream would jeopardize that. I know that the developer thinks he can create containment ponds for the stormwater, but it still has to go somewhere, and I've never seen water run uphill.

The Huse Street area now contains affordable housing, which is something that is in short supply. A much better use of this property would be a development with cottage homes or duplexes, which would fit the nature of the existing neighborhood. And, what is the rush? Why don't you wait to find out if any more apartments are even needed in this area after all the ones being built on Ephesus Church Road and the ones on Mt Moriah Road just across I-40, have been occupied? This is NOT the proper setting for even more luxury high-rise apartments and dense development.

Chapel Hill Town Council – September 2023 – Ann Rogers

I have lived on Clark Lake for almost 50 years, and am as concerned about its future as my neighbors, but wanted to bring in another perspective to the proposed plan.

The developer bought the Huse street parcel, knowing that it was zoned R-1, and knowing that the future land-use map (which you paid a LOT of money for) recommends that it remains R-1. He counted on being able to convince Council that he should be allowed to cram a lot more houses and apartments into this plot than the zoning allows.

Have you considered this: Maybe his strategy was to *start* with something as outrageous as his 7-story building (although it was described on the drawing as *only* 5-stories.) There were many objections, and you came to realize the absurdity of that plan. So, he backed-off to something that looks good *in comparison.* Maybe this was his strategy from the beginning…and he thinks he has a way of convincing you to approve something which has far more density than is appropriate for this area. **He is sure you will approve it since it looks so much better than his original plan.**

This is a perfect example of the "anchoring effect" in which someone's original plan or information sets the standard for any future negotiations. It's a strategy that is taught in law school, and this developer has sucked the Council right into it! Everyone seems so much happier with this revised plan because they are comparing it to the hideous original plan! Let's get back to the basics and design a plan that fits the neighborhood and the FLUM.

If you approve this plan, by tossing out the FLUM and rezoning the parcel, you have just opened Pandora's box, and other developers will probably seize the opportunity and follow suit. This is a terrible precedent to set! You need to think not just about this one design and what you do or don't like about it, but more importantly, the ramifications for future zoning changes. **Please look at the bigger picture!!**

This parcel CAN stay R-1 with affordable small homes on it, and the developer can still make a lot of money…without destroying the character of our neighborhood. We have no complaints about the plans for the parcel north of Old Chapel Hill Road, and that's where he should be building his multi-story buildings.

If approved, this development sets an awful precedent for the town of Chapel Hill.

This process, and the developer specifically, have not only been intentionally deceptive, but downright spiteful towards the community at every step of the process. In the past few months they have done the following:

- Proposed a plan very similar this current one, then changed it massively to include hundreds of extra apartments and parking, only to act as if they have significantly improved the third version by returning to something similar to their first attempt

- They have said there would be a four story building, while in reality it would be seven stories

- Labeled their sidewalk to nowhere as thousands of feet of “recreational space” to get around the city requirements

- Acted as if the area is accessible by bike or foot to schools, shopping, or recreation. Let me tell you as someone who rides a bike frequently, I know I am risking my life every single time I take Pope Road or Old Chapel Hill. No parent would or should allow their children to walk or ride on these roads.

- On the note of transportation, the area is horribly serviced by public transportation. Buses are infrequent and limited to the point of near uselessness. I myself have been stranded in downtown Chapel Hill due to the fact the buses do not run this way after 5pm. This is entirely car dependent sprawl that has ruined small to medium sized cities around the US.

- Perhaps most importantly, the developer has shrugged off any and all questions about the severe flood risk that this development would cause. I have lived on Clark Lake for almost my entire life, and I can tell you that the floods now are significantly worse than 10 or 20 years ago. Multiple times in the last three years, I have been trapped in or outside my house as a puddle roughly two feet deep floods my yard and the end of my driveway. In addition to that, The Clark Lake Lake dam would immediately become a ticking time bomb for the town of Chapel Hill, with all the homes at the bottom of the hill at extreme risk. The developer has responded spitefully that there will be storm management despite any real plan or interest in providing specifics.

Over and over, we have been asked what are the reasons for NOT approving this new development. I have to wonder what the possible reasons FOR approving it would be. Why are we significantly redistricting the Huse Street Property, and then on top of that allowing for an enormous exception to allow higher density. Why would you allow this developer to skirt the rules and put other people's homes and in some cases lives at danger just so that he can squeeze as many people as possible to improve his profits. Why are we building car dependent infrastructure in a town that is already reaching a breaking point with sprawl.

I'm of the generation that is struggling to afford property. I rent. Nearly everyone I know rents. Development is needed. I'm firmly pro-development, but it must be sustainable for the town and this is clearly just a quick buck for a developer who doesn't know or care about the area. I'm imploring the council to ask themselves why the hell are we doing this? It makes no sense for the town and it's disappointing to see it even considered.

Comments from Anne Hartley Regarding Chapel Hill Crossing South 9/27/23

1. Describe the context graphic.

TOCH Interactive Map Overlayed with Proposed CH Crossing, Clark Lake Dam location, and Planned Pope Road Culvert Replacement

(created by Anne Hartley, Clark Lake point of contact — 919-602-5012)

Town Council Meeting on 9/27/23

2. Dam Integrity and Stormwater Management is first and foremost about Public Safety.

3. What is the TOCH responsibility for Public Safety?

4. The owners of Clark Lake are proactively raising a public safety issue to the TOCH that there are legitimate concerns and issue with stormwater runoff and impacts to the Dam and how the development of Chapel Hill Crossing could contribute to the stress on the Dam.

a. It is the cumulative Development effect PLUS Climate change that is creating this issue now.

5. The repeated response that a 100-year flood requirement is a simple answer is nothing but a superficial platitude that is turning a dangerously blind eye to really important issues that needs to be investigated more thoroughly.

6. My investigation has led me to NCDEQ – Dam Safety, NCDOT (Pope Road Culvert and Hydraulics Unit (beyond Pope Road) to understand who should be at the table.

    a. No question the local municipality is the first line and that Clark Lake owners are raising proper concerns.

7. In the interest of Public Safety and the potential for other long term unintended consequent to the Dam function, there needs to be a clear understanding before making a upzoning decision and approving the conditional application that call for even more impervious surface than R-6!

8. Clark Lake proposes the formation of a stakeholder task force with a state-approved dam engineer from the dam Safety unit in partnership to do a feasibility study and then decide based on findings the development plans for the CH Crossing South.

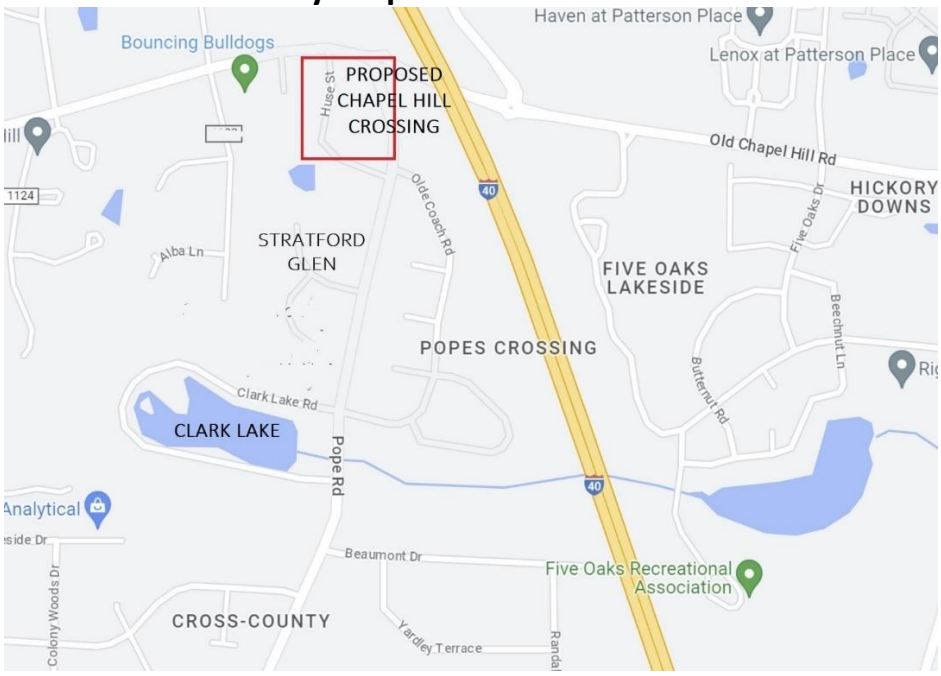
9. I sincerely request that this vote be delayed to properly address the critical foundational issue of SW runoff with current data adjusted for Climate Change as well as the state of the Dam and what scenarios could cause a catastrophic breach and how we collectively avoid that.

10. A blind vote by the Council on these critical issues will not set the stage for success!

Statement in Opposition to FLUM Modification and Chapel Hill Crossing

Submitted by Anne and Al Hartley
104 Clark Lake Road, Durham, NC (TOCH)
919-602-5012 (Anne's cell)

Vicinity Map for Areas of Concern



CONCERN #1: Traffic on Pope Road

Local residential and pass thru traffic on Pope Road is already significant, unsafe, and problematic. The negative side effects added by traffic from the proposed Chapel Hill Crossing will not have a good solution. Ed Harrison explains in most public meetings that I have attended that Pope Road cannot be improved. Please seek out details from Ed Harrison. If you need his contact info, please reach out to the Mayor's office and speak to Jeanne Brown.

CONCERN #2: Proposed FLUM Modification and Huse Street Component of Chapel Hill Crossing Can Cause Catastrophic Impact to Clark Lake Dam

Clark Lake on Pope Road – originally a 7-acre farm pond – is privately owned by Clark Lake Estates, a non-profit organization. Clark Lake Road that lies around the north, south, and west sides of the lake is owned and maintained by the Town of Chapel Hill. In addition to the open, walkable open space afforded by Clark Lake Road around the lake that is enjoyed by neighboring communities, Clark Lake serves in a strategic stormwater management capacitor for the town. This is recognized by a stormwater credit assigned to Clark Lake Estates.

Nearby development over the years has added stress to Clark Lake that has been compounded by the increased frequency of rain that causes the lake to overflow to the extent that the primary spillway cannot manage. This has led to a secondary flood zone created by nature. In addition, several Clark Lake homesites experience significant flooding.

There is great concern that the proposed FLUM modification to rezone the Huse Street property and the proposed Huse Street component of Chapel Hill Crossing will cause excessive stormwater runoff that could be the tipping point for the Clark Lake dam and cause a breach with catastrophic downstream flooding. This flooding would impact Pope's Crossing, I-40, and Five Oaks in Durham County. A second stormwater runoff pond is located in Five Oaks. Follow the flow of the water.

Regulations that simply state 'no additional runoff is allowed' cannot be guaranteed without enforcement to prevent this catastrophic event. These are the same regulations that have been in place for years, and – prior to other development – have absolutely

exacerbated runoff, compounded by climate change causing an increased frequency of flooding.

This is a very real concern that will not be prevented by words on paper if over development is approved. The only way to manage it is by land use management and not allowing a level of development that could be the catastrophic tipping point.

Several from the Town of Chapel Hill have visited Clark Lake in response to our concerns:

- Judy Johnson (Planning Dept) with Ernest Odei-Larbi (Stormwater Engineer), João Pereira (Stormwater Engineer), and Chris Roberts (Public Works Engineering)
- Council Members (Michael Parker, Karen Stegman, Adam Searing)

Responsible Action by Chapel Hill Leadership

The responsible action that we are counting on from Chapel Hill leadership is **to reject** the FLUM modification that will allow over development in this area and **continue** to constrain the level of development with the current zoning. This leadership should request a new development plan for the Huse Street property that is based on current zoning.

Invitation to Visit Clark Lake

If you have not already had the opportunity, please come visit this area and experience it firsthand to best understand the impacts described herein.

Pictures of Clark Lake Follow

Layout of Clark Lake Dam and Overflow/Flooding Management

Normal Clark Lake conditions that show where the lake overflows.

Flooding on 4/30/23 which occurs regularly in addition to flooding on Clark Lake home lots.

Secondary spillway that has been created by the flooding over the last few years:

Pope Road where the car is passing.

Petition Endorsement from Charles Berlin 2/28/2024

A serious concern related to this petition are the approval standards currently used by town storm water staff. These are tied by regulations to calculating runoff based on use of published NOAA data that are now far out of date, which do not take into account climate change. (The last revision of the NOAA Atlas 14 vol 2 ver 3.0 which includes North Carolina, was published in 2006). This serious problem has been widely written about in national media.

Town staff has readily acknowledged that these mandated standards are significantly outdated. Staff have also acknowledged that the proposed "100 year storm" mitigation system may thus in the real world function at a far lower level, given climate change, with potential flooding occurring in the development in question significantly more frequently. While this might suffice for an area not already prone to flooding which has only land that will flood, when it is a small lake with an earthen dam that will be receiving this runoff (with risk of catastrophic sudden failure that would magnify the consequences many times over), the level of concern is inevitably higher. This development will bring 208,000 square feet of additional new impervious surface on the South property, going from the current 12% to 56% of this site. Thus, it is not surprising that neighbors downhill from this development, who already experience regular surface flooding from the development site, and those who live around Clark Lake with its earthen dam, would want assurances that the current state of the dam can withstand this.

Discussion directly with the developer prior to the council vote, plus his promise at the council vote to fund a further study covering the "entire basin" was reassuring to all the interested public there, who uniformly understood "entire basin" to mean that the developer was agreeing to include the dam integrity in this study. Subsequent comments from council indicated they also understood this as focusing on the dam (which helped them then justify a positive vote to approve this development.) It is thus disheartening that the developer later reneged on this promise by apparently subsequently twisting the linguistics of what he promised at the council vote to then later exclude the dam integrity piece of the study, and that the subsequent town approval ordinance also appears to have misunderstood what council had agreed to.

Given that this study will not need to address any further new development of the basin at this time (as none is in the pipeline), it is obvious that there will be no changes to be evaluated for pre/post development runoff in the entire basin other than CH Crossing South. Thus the only relevant thing left to further study in this "entire basin" evaluation is the dam integrity. It is thus hard to fathom how town staff later felt formal further approval should be given under these circumstances, when the developer had subsequently reneged on the seemingly clear promise to council to fund a study of the *entire* basin, i.e. the dam integrity.

For the above reasons I fully endorse the steps requested in this petition.

Respectfully submitted,

Charles Berlin
community liaison to TOCH for CH Crossing development