CLIMATE ACTION STRATEGIES

The CAP working groups developed strategies for climate action across the Institute. Community, Equity, and Accessibility strategies are presented as an initial framework and integrated throughout the other focus areas to ensure equitable access and impact. The remaining strategies were organized into eight focus areas:

**COMMUNITY, EQUITY & ACCESSIBILITY**

<table>
<thead>
<tr>
<th>MITIGATION &amp; ADAPTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUILDING ENERGY</td>
</tr>
<tr>
<td>Strategies that reduce Scopes 1 and 2 emissions, increase energy efficiency, and reduce energy consumption in buildings.</td>
</tr>
<tr>
<td>RENEWABLE ENERGY &amp; OFFSETS</td>
</tr>
<tr>
<td>Strategies for implementing renewable energy sources and offsets.</td>
</tr>
<tr>
<td>MOBILITY</td>
</tr>
<tr>
<td>Strategies that support fossil fuel-free mobility within campus and to and from campus.</td>
</tr>
<tr>
<td>MATERIALS MANAGEMENT</td>
</tr>
<tr>
<td>Strategies that address how materials are bought, used, recovered, and disposed.</td>
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<tr>
<td>WATER MANAGEMENT</td>
</tr>
<tr>
<td>Strategies that increase the efficiency and conservation of water management, including potable water, greywater, blackwater, and stormwater.</td>
</tr>
<tr>
<td>CARBON SEQUESTRATION</td>
</tr>
<tr>
<td>Strategies that increase the amount of carbon dioxide sequestered through natural resources on campus.</td>
</tr>
</tbody>
</table>

**RESEARCH**

Strategies that support and expand current climate-related research and solutions.

**EDUCATION**

Strategies that advance Georgia Tech’s academic programs to prepare staff and students for climate action.

How to Read These Pages

**PRIORITY**

It is important to assess the priority of each strategy for reaching 50% reduction in carbon emissions by 2030 and 100% by 2050. Priorities for each strategy are based on emissions reduction potential, broader goals of the Institute, and stakeholder feedback. Stakeholder feedback was collected from students, staff, and faculty during engagement events through polls and comment periods. Priority is indicated by low, medium, and high.

- **HIGH**
- **MEDIUM**
- **LOW**

**COST OF IMPLEMENTATION**

A cost analysis was developed to estimate expected implementation costs through 2050. Estimated costs are based on assumptions in the GHG model. Strategies that were not modeled are estimated for cost based on time and resources necessary for successful implementation. The estimated cost for each strategy is indicated by dollar symbols.

- $$$$: High Cost
- $$: Medium Cost
- $: Low Cost

**TIME FRAME**

Strategies will be implemented at varying start dates and require different timelines between 2024 and 2050. Some can be implemented quickly while others require ongoing implementation. Time frames are based on expected implementation dates.

- **Short-term** by 2030
- **Medium-term** by 2040
- **Long-term** by 2050

Each focus area provides an overview of the climate action strategies and details how each strategy aligns with:

- United Nations Sustainable Development Goals (UN SDGs): A full overview of how the CAP strategies align with the UN SDGs can be found in Appendix E.
- Institute’s strategic plan.
- Georgia Tech’s Sustainability Next plan.

**Priorities of Strategies**

- Strategy modeled for emissions reduction potential.
- Strategy met the criteria for “low-hanging fruit” based on low-cost, high-priority, and high-emission reduction potential.
- Strategy had significant contributions from students or was developed by the student working group.

**Cumulative GHG Reduction Potential**

- Modeled strategies were noted as low, medium, or high for potential emissions reductions by 2050.
- Strategy resulted in emissions reductions > 100,000 mt CO2e.
- Strategy resulted in emissions reductions between 50,000 and 100,000 mt CO2e.
- Strategy resulted in emissions reductions between 0 and 50,000 mt CO2e.

N/A: Strategy was not modeled since potential GHG reduction is unknown.

**Building electrification**

The process of replacing equipment that relies on the combustion of fossil fuels with technologies that are electrically powered. Building electrification is a key strategy in the transition to a carbon-free future for buildings and infrastructure. Strategies that reduce Scope 2 emissions are included in the Institute’s Sustainability Next Plan.

The largest contributor to Georgia Tech’s greenhouse gas emissions is the burning of natural gas to generate steam and hot water for the purpose of heating buildings and domestic hot water.

With few exceptions, most of Georgia Tech’s campus heat is dependent on the combustion of natural gas.

Approximately half of Georgia Tech’s campus heating load is supplied through “direct fired” furnaces or “condensing” heating plants, while the other half is supplied by coal-fired or other gas-fired equipment. While steam is used to transfer heat from the central plant to the buildings, most buildings connected to the central plant shift this hot water once inside the building — meaning the buildings do not need steam, only hot water.

In the same time, heating boilers for the most campus buildings are undersized to take advantage of both sizes of the heating and cooling cycles, and all are distributed to the campus to serve both the heating and cooling requirements.

This transition can replace over 90% of Georgia Tech’s heating load and will optimize the efficiency of about five times greater than that of the current heating systems.

Additionally, minichanging the use of existing towers to more heat will save millions of gallons of water annually.
CLIMATE ACTION STRATEGIES

MOBILITY

GUIDING PRINCIPLE
We optimize campus mobility through a variety of transportation modes that are accessible, affordable, and low- to no-emissions, considering environmental and human health impacts when determining and implementing transit and land use decisions.

ALIGNMENTS

SDGs
Institute’s Strategic Plan: Amplify Impact, Champion Innovation, Cultivate Well-Being, Lead by Example

Sustainability Next: Lead by Example in the Practice and Culture of Sustainability

The Mobility working group focused on developing strategies for decreasing transport emissions on campus, commuting to and from campus, and air travel to and from campus.

This set of strategies includes transitioning the Institute to zero-emission vehicles, implementing infrastructure required to support zero-emission vehicles, and increasing options for net-zero commuting and air travel. Micromobility — transportation options such as walking, bicycles, and scooters — is also included.

The strategies in this section seek to reduce the carbon footprint associated with mobility by implementing more sustainable and inclusive mobility options for the Georgia Tech community.

In addition, it includes incentivizing other sustainable transportation options, such as working with local community organizations to increase and improve public transit options.

“Parking and Transportation Services is excited to be a key piece of the Georgia Tech fabric dedicated to improving and increasing sustainability initiatives. We continue to strive for greater heights by electrifying our fleet, increasing our regional transit commuter ridership, improving bicycling options, and incorporating campus micromobility programs.”

— Derrick Walker, Director of Transportation, Campus Transportation
### 3.1 Transition the campus vehicle fleet to zero-emission vehicles and equipment

**Priority:** HIGH  
**Estimated Cost:** $$  
**Time Frame:** Short-term  
**GHG Reduction Potential:**

Transitional campus vehicle fleets to zero- or low-emission alternatives is a current Institute priority.

This strategy focuses on increasing the number of vehicles that have low or no tailpipe emissions, with an emphasis on electrification. Key actions for success include analyzing charging needs and habits, adding charging infrastructure, factoring in lead time for transformers, and developing procurement contracts for implementation.

The transition to zero-emission vehicles will contribute to improving air quality and noise reduction on campus.

The transition to a zero-emission transportation system requires modifications to campus infrastructure and resources to accommodate innovative technologies and methods of transportation. Evaluating bus routes, securing necessary resources, instituting a clean transportation policy, and assessing the impact of heavier electric equipment on staff efficiency and health are important for ensuring infrastructure changes that are sustainable in the long term.

In addition, the use of micromobility options, such as bikes, scooters, and skateboards, has increased on campus.

Updating infrastructure to include these alternatives is important to ensure greater accessibility and safety. Potential improvements include implementing covered bike parking, e-bike charging, and installing showers and lockers in buildings to support the increased use of these vehicles.

#### Air Quality

In addition to GHGs that have global warming impacts, vehicles emit other criteria air pollutants, including carbon monoxide (CO), particulate matter (PM), sulfur dioxide (SO2), and nitrogen dioxide (NO2). These pollutants decrease air quality at the local level and can be harmful to human health. Historically, many parts of Atlanta have been considered “non-attainment zones” for meeting air quality regulation.

#### Electric vehicles (EVs) and other low-emission technologies eliminate tailpipe emissions, providing an important co-benefit to this strategy by supporting improvements to Atlanta’s overall air quality.


2. Motor vehicle exhaust contributes to the formation of ground-level ozone.


5. 20(1). https://doi.org/10.3390/ijerph20010573


### 3.2 Increase sustainable and affordable commuting options

**Priority:** HIGH  
**Estimated Cost:** $  
**Time Frame:** Long-term, ongoing  
**GHG Reduction Potential:**

Commuting represents Georgia Tech’s highest source of Scope 3 emissions. Increasing sustainable commuting options is key to reaching Georgia Tech’s net-zero goals, but it is also an important strategy for supporting employees and students in getting to and from campus.

This strategy represents an opportunity to increase affordable and equitable transportation options. While public transportation is available, collaborating with local community partners such as Atlanta’s primary public transit agency, MARTA, to improve accessibility and affordability is essential to the success of this strategy. Additional components include adding mobility hubs around campus to increase access.

#### Mobility Equity Considerations

**Commuting**

The cost of housing in Atlanta has increased in recent years, requiring Georgia Tech students and employees to either pay more for housing or move further away from campus¹. While commuting increases emissions and air pollution, it also leads to negative financial, physical, and mental impacts.¹ Increasing the availability of affordable housing for students and staff on campus, or close to campus, can make walking, biking, and transit more equitable and provide healthier mobility options.

**Inclusivity and Safety**

While some community members may easily adopt alternative modes of transportation, updating micromobility systems and campus infrastructure to include individuals of all physical abilities is a high priority. Safety must also be prioritized as micromobility options are increasingly sharing the roads with cars.
3.3 Reduce emissions from airline travel

Air travel is included in Scope 3 and represents the second highest emissions source for mobility. It is often essential for Georgia Tech students and employees to further educational and research pursuits. Emissions from air travel include travel to and from conferences, other related business travel, and study abroad programs for students.

Implementing an emissions tracking method for air travel is a key action for measuring the success of this strategy since it can be hard to track when students and employees purchase flights independently. Other actions include providing resources and education for stakeholders to understand options for lower-emission flights and alternatives, monitoring air travel related to Institute activities, and considering carbon offset purchases.

<table>
<thead>
<tr>
<th>MEASURE</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% zero-emission vehicle fleet and supported infrastructure</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased percentage of zero-emission commuting</td>
<td>10%</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td>Air travel emissions tracking platform</td>
<td>✔</td>
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