

—PUBLIC HEALTH, PARKING LOTS, CLIMATE CHANGE—

August 19, 2021

Planning Board  
8 Newmarket Road  
Durham, NH 03824

RE: 19-21 Main Street – Parking Lot. Formal application for site plan and conditional use for parking lot on four lots and reconfiguration of the entrance. Toomerfs, LLC c/o Pete Murphy and Tim Murphy, property owners....Map 5, Lots 1-9, 1-10, 1-15, and 1-16. Church Hill District.

**“Climate change is a health emergency.”**

[Seattle and King County’s chief public health officer, in “Climate Change Has Gotten Deadly. It Will Get Worse.” *The Washington Post*, July 3, 2021.]

Climate change—and measures that either exacerbate or mitigate its impacts on public health—should be front and center in Durham’s planning. The Board has the authority<sup>(1)</sup> to support appropriate related health-critical measures.

You have all read or heard about both climate change and the dire impacts on human health of increasingly extreme environmental conditions, so I’m going to keep things simple, with references only to commonly-accessible media rather than to professional journal articles.

**Here’s how the Toomerfs parking lot proposal could directly affect public health.**

Heat islands (parking lots without extensive tree canopy are a prime example) will lead to:

- an increase in demand on the electric grid—affecting Durham and beyond
  - heat island effects of parking lots have been studied rigorously, but our own experience also tells us that heat from both vehicles and asphalt can raise an area’s temperature significantly, whereas tree canopy provides passive cooling through shade and evapotranspiration<sup>(2)</sup>
  - air conditioner use by abutting residents and employees is highly likely to rise as a result of tree canopy loss and increase in impervious surfaces
  - power outages during increasingly frequent and intense heat waves can affect thousands, particularly the heat-vulnerable
- a decrease in air quality / increase in pollution—downtown and neighborhoods
  - additional vehicle-related nitrous oxides<sup>(3)</sup>
  - fewer trees to filter air pollutants, of particular concern to vulnerable populations

...and contribute to climate change, since the project would:

- increase use of A/C (which use refrigerants, such as Freon, that destroy the ozone layer—“...which one classic science writer describes as ‘all that stands between us and speedy death.’”)  
[“Is our reliance on air-conditioning warming the planet?” *The Washington Post*, July 21, 2021]

- promote emitting and polluting vehicle use over making pedestrian use more attractive and safe (which is considerably more appropriate in a compact downtown), leading to higher greenhouse gas emissions and vehicle-related pollution
- increase emissions of vehicle-related nitrous oxides<sup>(4)</sup>

### Modeling: Public versus Private actions

To head off at the pass cries of “Unfair!” and “What about...”:

- Public health and climate change know no “political” boundaries, e.g., between governmental entities and private property.
- UNH has large parking lots? Those are decades old. In the past 15 years or so, UNH has been on a full-court press to reduce on-campus vehicle use.
- Durham is adding parking to ATO 66 Main street? Planned parking will provide a public, not purely private, benefit; plus, the existing lot was primarily treeless.

### Acknowledgment, and yet...

As I have noted earlier, the aesthetic and safety benefits to the community of restructuring the access on Main Street must be funded by offsetting economic benefits to the property owners. However, the current proposal is extreme. It simply is not a good tradeoff.

To be preachy: Durham is not an island when it comes to climate change and public health: local actions affect regional, if not state, populations. If we wish to benefit from other towns’ attempts to mitigate climate change, we must be mindful of our own actions.

Responsible hikers in fragile environments follow mantras “leave no trace” and “pack out what you pack in.” Some people are guided by a philosophy of leaving the world a better place. Both approaches are relevant to land use planning in a time when we are acutely aware of climate change. Our collective small choices do make a difference.

Regards,

—*Robin*

### Footnotes

1) Authority of the Planning Board, derived from the State:

**175-3. Purpose.**—The provisions of this chapter are intended to regulate the use of land for the purpose of protecting the **public health**, safety, convenience and general welfare of the residents of the Town of Durham, in accordance with RSA 674:17. This chapter is adopted in accordance with and in order to implement the Master Plan and other policies designed to promote the orderly growth of the Town of Durham. Among other purposes, this chapter is specifically adopted **to preserve air and water quality**; to conserve open space and agricultural resources; to encourage the installation and use of renewable energy systems and protect access to renewable energy sources; to protect natural and scenic resources from degradation; to provide for recreational needs; to protect life and property from flooding and other natural hazards; to preserve historic sites and structures; and **to ensure that development is commensurate with the character and physical limitations of the land**. Further, this chapter is designed to ensure

that the timing, location and nature of new development takes into account the immediate and long-range financial impacts of proposed uses and enhances the achievement of the town's economic development goals.

## 2) Heat island effect, benefits of trees:

"Trees can lower air temperature in city neighborhoods 10 lifesaving degrees, scientists have found. They also reduce electricity demand for air conditioning, not only sparing money and emissions, but helping avoid potentially catastrophic power failures during heat waves."  
"...Trees are, quite simply, the most effective strategy, technology, we have to guard against heat in cities,' said Brian Stone Jr., a professor of environmental planning at the Georgia Institute of Technology....In addition to reducing heat, trees filter out air pollution, suck up storm water, store carbon, nurture wildlife and even improve people's mental and physical health. It's hard for us to think of trees as actual infrastructure rather than an amenity, and because of that, we don't allocate sufficient funds. If we think about it as actual infrastructure on par with investing in roads and sewers and everything else, those costs will become more acceptable to us.'  
"...A tree's shade, that sweet relief from solar radiation, is only part of its cooling power. Trees also evaporate water, pulling it from the ground and releasing it into the air through their leaves."

["What Technology Could Reduce Heat Deaths? Trees." *The New York Times*, July 2, 2021.  
<<https://www.nytimes.com/2021/07/02/climate/trees-cities-heat-waves.html>>]

## 3) and 4) Nitrous oxides (N<sub>2</sub>O, NO<sub>2</sub>, NO<sub>3</sub>, et al)

Greenhouse Gas Emissions | Understanding Global Warming Potentials [GWP]

...Nitrous Oxide (N<sub>2</sub>O) has a GWP 265–298 times that of CO<sub>2</sub> for a 100-year timescale. N<sub>2</sub>O emitted today remains in the atmosphere for more than 100 years, on average.  
[<https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>> last updated on September 9, 2020]

What is NO<sub>2</sub> and how does it get in the air?

Nitrogen Dioxide (NO<sub>2</sub>) is one of a group of highly reactive gases known as oxides of nitrogen or nitrogen oxides (NO<sub>x</sub>). Other nitrogen oxides include nitrous acid and nitric acid. NO<sub>2</sub> is used as the indicator for the larger group of nitrogen oxides.

NO<sub>2</sub> primarily gets in the air from the burning of fuel. NO<sub>2</sub> forms from emissions from cars, trucks and buses, power plants, and off-road equipment. [<https://www.epa.gov/no2-pollution/basic-information-about-no2#What%20is%20NO2>]

Effects of NO<sub>2</sub>: Health effects

Breathing air with a high concentration of NO<sub>2</sub> can irritate airways in the human respiratory system. Such exposures over short periods can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions and visits to emergency rooms. Longer exposures to elevated concentrations of NO<sub>2</sub> may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma, as well as children and the elderly are generally at greater risk for the health effects of NO<sub>2</sub>.

NO<sub>2</sub> along with other NO<sub>x</sub> reacts with other chemicals in the air to form both particulate matter and ozone. Both of these are also harmful when inhaled due to effects on the respiratory system. [<https://www.epa.gov/no2-pollution/basic-information-about-no2#What%20is%20NO2>> Last updated on September 8, 2016]