

— *HYDROLOGICAL IMPACTS : VEGETATION (OR, THERE GOES THE BUFFER)*

August 5, 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. Mike Sievert, engineer. Robbi Woodburn, Landscape Architect. Map 5, Lots 1-9, 1-10, 1-15, and 1-16. Church Hill District.

Dear Members of the Board,

It is time to pay attention to the proposal's potential impacts on vegetation intended to remain after construction—including planning to ensure that it remains healthy.

What good will it do to establish a vegetated buffer, only for its trees and shrubs—and any installed landscaping—to die because we don't plan well enough for their survival?

Request a hydrological study? Urban forester's input?

Who is modeling the proposed drastic change to the hydrologic cycle and its impacts on vegetation, whose health depends on access to water retained in the surrounding soils?

Large-scale tree removal would likely result in the “loss of interception capability due to the loss of leaves, trunks and stumps...The urban canopy intercepts precipitation, reducing and spatially redistributing the effective precipitation that reaches the land surface...”

[“Monitoring and predicting the impacts of trees on urban stormwater volume reduction” USGS
<https://www.usgs.gov/centers/umid-water/science/monitoring-and-predicting-impacts-trees-urban-stormwater-volume-reduction?qt-science_center_objects=0#qt-science_center_objects>

Put another way: How is the remaining vegetation to thrive with significantly less access to water than it has today?

The following impacts will be serious, even apart from construction-related loss and damage, and even given the construction protections in our site plan regulations:

- removal of trees, which transpire water and shade each other
- alteration of slope
- replacement of water-retentive and filtering soils with heat-retentive hardscape
- stress on remaining trees from higher nighttime (as well as daytime) temperatures associated with the heat island of the parking lot, making it harder for them to minimize moisture loss
- thermal impact of runoff: water temperature flowing off an unshaded parking lot will be higher than water filtering through undeveloped soils, particularly shaded wooded areas; what impact would that have on the buffer vegetation, let alone the temperature of water in College Brook, and thence, in Mill Pond?

How long will any natural vegetated buffer survive—particularly mature trees?

Ways we may lose vegetated buffers include:

- Stress on remaining vegetation will be further exacerbated by increasingly frequent periods of low precipitation, if not outright drought, brought by climate change.
- Impervious surfaces directing rainfall to a stormwater management system deprive surrounding vegetation of access to groundwater, particularly critical during dry seasons (as we have experienced over the past few years).
- Trees remaining after clearing and construction are likely to be affected by related shock and damage; fatal construction-induced damage may not become evident for years.
- Trees may also be affected by the loss of what recent research has discovered is a sharing of resistance to stress, disease, and pests among trees in the same area (no, not “a stretch of the imagination,” but scientifically documented).

Durham does not have a great track record for planning to protect mature trees when developing a property; note the heartbreaking loss of a large mature oak on Madbury Road due to poor planning for Madbury Commons.

Establishing or requiring buffers will only be feel-good measures, if the buffers do not function as intended.

With the authority of Conditional Use, if the Board approves this—or any—application, it should require planning for both growth to maturity (with a focus on roots) and improved tree protection during construction.

Please seek independent, expert advice about how to ensure any vegetated buffer function.

Regards,

—Robin