

DALTON'S SIDEWALKS: WHY CONCRETE IS BETTER THAN ASPHALT

The challenge: Maintaining aging concrete sidewalk infrastructure in the Town has become a priority – especially in light of concerns from Dalton residents over the past year about the state of our sidewalks.

Department of Public Works proposed solution for Fiscal Year 2025: At the 2/26/2024 Select Board meeting, DPW Superintendent Bud Hall proposed purchasing a mini-asphalt track paver as part of his FY25 budget, indicating he would use this machine to **replace failing concrete sidewalks around Dalton with asphalt ones**. Bud's reasoning, when asked, was that he believes this approach would save the Town money and time.

In response to the proposed asphalt solution, here are some top-level considerations and concerns:

CONCRETE WILL COST DALTON THE SAME OR LESS THAN ASPHALT OVER TIME. According to a majority of available research and expert opinions,^{1,2,3} 5-inch thick concrete sidewalks (aggregate base, no curb) are twice as expensive to install as 2-inch thick asphalt sidewalks (same aggregate base, no curb) – and although the material costs of asphalt and concrete have both risen substantially over the past decade, the rate of increase for both has been the same into 2024 (see FRED charts in References). However, the expected service life of a concrete sidewalk, which requires little maintenance if any, *is at least twice that of asphalt*,⁴ with asphalt requiring more frequent routine maintenance as well. Which means that, although concrete does have a higher initial cost, **the cost of concrete sidewalks over time ends up being either the same or less than asphalt.**

CONCRETE SIDEWALKS CAN BE LIFTED INSTEAD OF REPLACED. One much less expensive repair option for concrete sidewalks that are not cracked and in otherwise good condition is lifting individual slabs with stone slurry grout leveling, mudjacking, or injected polyurethane (“polyjacking”). When proper leveling techniques and equipment are used, the performance and durability of the lifted concrete is the same as the original concrete.⁵ This approach is not available for asphalt, and there are several sidewalks in Dalton (for example see 3rd Street photo in References) where these methods could be used to restore concrete sidewalk utility and safety.

CONCRETE SIDEWALKS PROVIDE BETTER SAFETY, WALKABILITY, AND YEAR-ROUND ACCESSIBILITY. According to many Massachusetts town building codes,⁶ ADA guidance,⁷ MassDOT recommendations,^{8,9} and multiple case studies,¹⁰ **concrete is the “preferred surface material” for municipal sidewalks**, and is often exclusively specified. Why? We've already covered the durability, longevity, and potential cost-savings of concrete as one reason. But asphalt surfaces are also hotter in the summer, producing VOCs as they heat up. Asphalt is also less visible than concrete in low-light

¹ https://vtrans.vermont.gov/sites/aot/files/highway/documents/ltf/VTrans%20Path%20and%20Sidewalk%20Cost_Report_2020.pdf

² <https://certifiedmtp.com/blog?p=asphalt-vs-concrete-a-comparative-study>

³ <https://www.bobvila.com/articles/asphalt-driveway-cost-vs-concrete/>

⁴ https://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa13037/chap6.cfm

⁵ <https://scholar.utc.edu/cgi/viewcontent.cgi?article=1724&context=theses>

⁶ <http://www.masshousingregulations.com/>, <https://ecode360.com/>

⁷ <https://www.ada.gov/law-and-regs/design-standards/2010-stds/>

⁸ https://www.mass.gov/files/documents/2018/09/17/MunicipalResourcesGuideForWalkability_2018-08-24.pdf

⁹ <https://www.mass.gov/doc/construction-and-materials-best-practice-for-concrete-sidewalks-final-report/download>

¹⁰ http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=39

conditions. **Both of these factors increase health and safety risks for Dalton residents when using asphalt for sidewalks.** As Carson Ave sidewalk photos illustrate (see References), asphalt can deform, crack, and break down over time. Even in good lighting conditions, uneven asphalt is difficult to navigate for parents with strollers; people using wheelchairs, walkers, or canes; and elderly folks vulnerable to trip hazards. For people aged 65-84 years, falls are the second leading cause of injury-related death, and 12% of all falls are slip-and-falls.¹¹ In low-light conditions, uneven asphalt can be outright treacherous because its surface is less visible than concrete. Maintained concrete, in comparison, *is inherently flat, smooth, visible, and stable*. Concrete also absorbs and reflects less heat, and does not release as many harmful VOCs as asphalt.

CONCRETE SIDEWALKS PREDICTABLY IMPROVE PROPERTY VALUES, RESIDENT HEALTH, AND ACCESS TO BUSINESSES & RECREATION. In general, increasing a Town’s safety and walkability (and related “walkability score”) increases revenue both directly to local businesses and indirectly to the Town through property taxes.¹² There is also plentiful data to support the importance of sidewalks for community health, safety, and as a public good – *often with a specific recommendation or requirement for cement concrete as the sidewalk material*.^{13,14,15} Although most available data correlating municipal pavement condition (PCI) with residential and commercial property values evaluates roads, there is some data supporting value increases from well-maintained sidewalks as well.^{16,17,18} No data supported asphalt being superior to concrete for sidewalks, except for temporary repairs or places where aggregate base could not be installed.

CONCRETE IS BETTER THAN ASPHALT FOR ENVIRONMENTAL SUSTAINABILITY AND SOCIAL RESPONSIBILITY. Sampled research offers a variety of contradictory claims. However, according to studies not funded by industry,^{19,20} asphalt and concrete production both have large greenhouse gas (GHG) footprints and other environmental impacts. However, asphalt absorbs and reflects more heat, is petroleum-based, has higher risks for worker health during installation,²¹ and increases community asthma and other health risks due to VOC off-gassing during its lifetime.²² Add to this that asphalt’s lifespan is less than 50% that of concrete – requiring more high-VOC/GHG repairs to maintain or reinstall – and concrete wins the environmental sustainability contest by a wide margin. It should be noted that both are recyclable, and have “green” sourcing options. For example, a “cold-in-place” option for road asphalt is available, as well as low-carbon concrete options.²³

¹¹ <https://nfsi.org/nfsi-research/quick-facts/>

¹² <https://www.marketwatch.com/story/how-walk-score-boosts-your-homes-value-2016-08-11>

¹³ <https://www.planning.org/pas/reports/report95.htm>

¹⁴ <https://nacto.org/publication/urban-street-design-guide/street-design-elements/sidewalks/>

¹⁵ <https://betseybuckheit.com/posts/the-cost-and-or-value-of-sidewalks/>

¹⁶ <https://www.truebloodre.com/blog/5-neighborhood-amenities-that-increase-your-homes-value>

¹⁷ <https://archive.sdho.org/2011/12/sidewalks.pdf>

¹⁸ <https://www.character towns.org/wp-content/uploads/2020/01/5-Sidewalk-Study-Conclusions-11.15.19.pdf>

¹⁹ <https://docplayer.net/24520179-Comparison-of-cost-and-environmental-impact-of-concrete-and-asphalt-roads-david-calhoun-and-danny-smyth.html>

²⁰ <https://www.eeer.org/journal/view.php?number=1017>

²¹ <https://www.sciencedirect.com/science/article/abs/pii/S0959652619336273>

²² <https://pubs.rsc.org/en/content/articlehtml/2023/ea/d3ea00034f>

²³ <https://rmi.org/low-carbon-concrete-in-the-northeastern-united-states/>

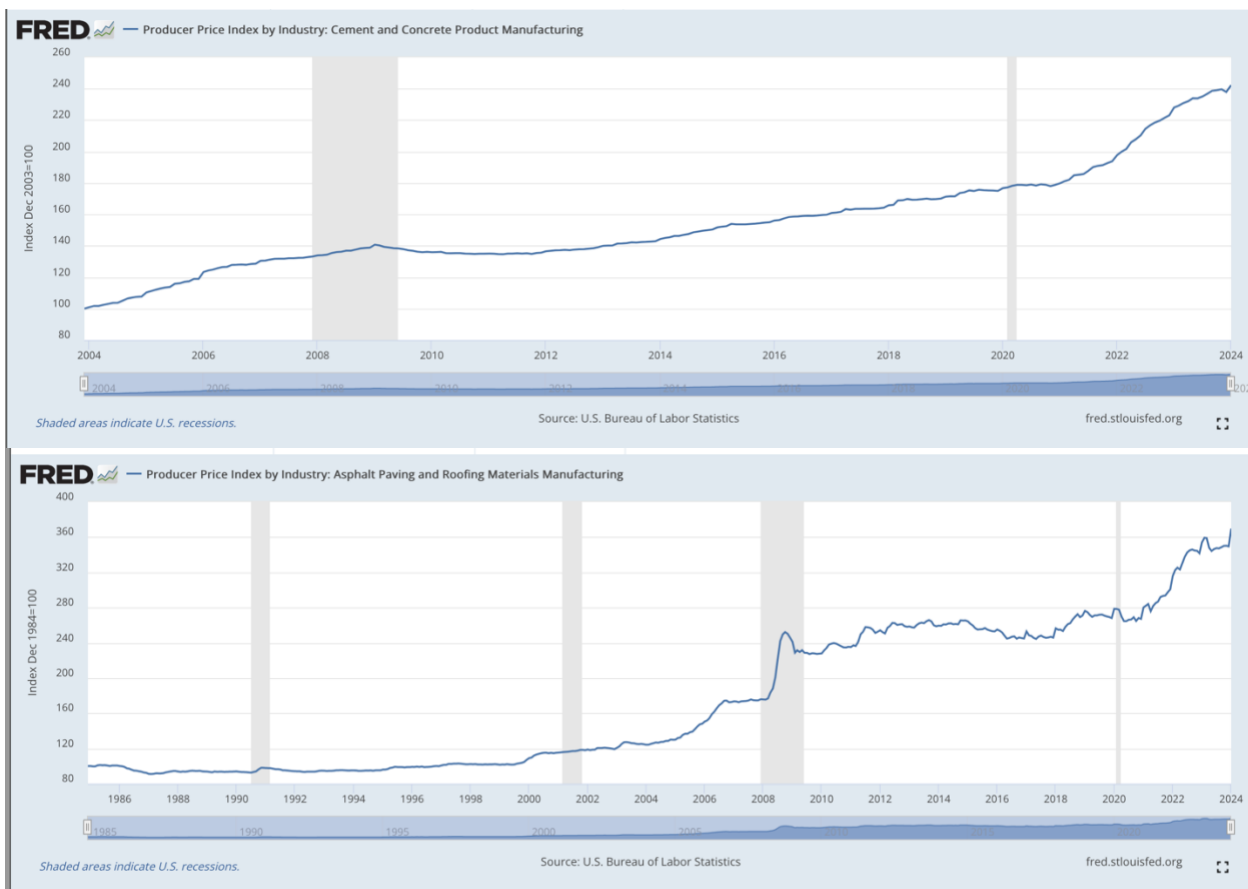
Next Steps?

Here are some next steps I am working on as of this writing:

1. Gathering opinions from Dalton residents about this issue.
2. Additional research on types and status of existing sidewalks in Dalton.
3. Additional research on how other New England towns have dealt with this issue.
4. An amendment to Dalton’s regulations to specify concrete as our sidewalk standard.
5. Additional research on local sustainable sourcing options.
6. Scheduling a presentation to the Select Board on findings and recommendations.
7. Considering ways Dalton could fund sidewalk repairs over the next five years.

Additional References

Concrete and Asphalt Price Increases



Heaving and Cracking of Asphalt Sidewalk (Carson Ave, Dalton)



Example of concrete sidewalk slab that could be “lifted” instead of replaced (3rd Street)

