FRANCIS O. DAY CO., INC.

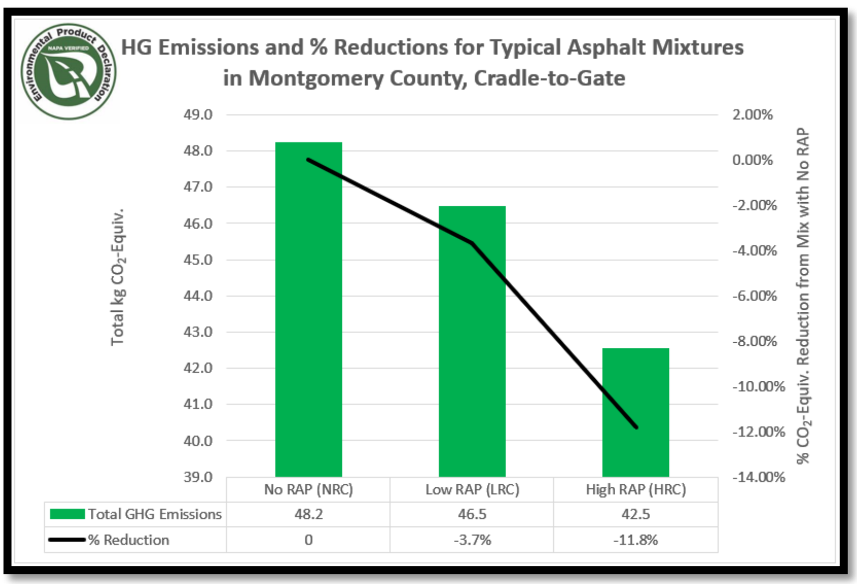
850 East Gude Drive, Suite A, Rockville, Maryland 20850

Phone 301-652-2400 Fax 301-340-6592

February 26, 2021

Thank you for the opportunity to comment on Montgomery County's draft Climate Action Plan (CAP). The CAP is very ambitious and sets out a path for significantly reducing the County's greenhouse gas (GHG) emissions and improving resilience to the effects of climate change.

Montgomery County maintains 5,200 lane-miles of roads, most of which are surfaced with asphalt pavements. Maryland's asphalt pavement industry offers multiple solutions to help the County achieve its goals of reducing GHG emissions and improving climate resilience. The use of recycled materials, reduced mix production energy, and the Perpetual Pavement design approach are readily available tools for reducing the embodied carbon emissions associated with asphalt pavements. Additionally, Perpetual Pavements offer the added functionality of providing a resilient design solution that can be adapted to changing climate conditions.



Use of Recycled Materials

Old roads and parking lots are completely recyclable, and asphalt pavements are one of the most recycled materials in America. Reclaimed asphalt pavement (RAP) replaces new aggregates and asphalt binder, yielding GHG reductions of more than 2 million metric tons by avoiding the emissions from producing those materials while providing over $3 billion in economic savings to the U.S. economy.[1] A review of verified environmental product declarations (EPDs) developed by F.O. Day, an asphalt mix producer and paving contractor that serves Montgomery County, indicates that an asphalt mix containing high RAP content reduces cradle-to-gate GHG emissions by nearly 12% when compared to a mix without RAP.[2]

Reduced Mix Production Energy

Warm mix asphalt (WMA) technologies improve compaction at lower temperatures and enable asphalt pavement plants to reduce mix production temperatures compared to traditional hot-mix asphalt. A thorough analysis of WMA technologies conducted by the National Academies of Sciences, Engineering, and Medicine found that asphalt plants using WMA technologies can reduce their direct CO_2 emissions by 3 – 32%, depending on the temperature reduction achieved by the plant.[3] Many of the asphalt plants that serve Montgomery County are capable of producing WMA.

Perpetual Pavements

The Perpetual Pavement design methodology ensures that pavements are designed with enough strength and durability to eliminate the potential for structural failure, thereby eliminating the need for full-depth reconstruction to rehabilitate old pavements. Although the surface wearing course requires periodic maintenance, those repairs are relatively easy and cost-effective to make. With a pavement structure that lasts beyond 50 years, overall maintenance activities are greatly reduced.[4] The Federal Highway Administration recently found that an Iowa highway designed as a Perpetual Pavement will yield life cycle costs savings of 17 – 28% (depending on the discount rate used) while also reducing life cycle GHG emissions by nearly 20% when compared to a conventional asphalt pavement design.[5] Additionally, Perpetual Pavements have been recognized as a resilient design solution since the surface layer can be adapted to changing climate conditions during periodic maintenance activities.[6] The thicker asphalt pavement structure is also resistant to moisture damage and more likely to remain serviceable after a flood event.[5]

In summary, asphalt pavements can help contribute to Montgomery County's climate goals through the use of recycled materials, reduced mix production temperature, and the Perpetual Pavement design methodology. We recommend Montgomery County consider including these readily available technologies and practices in the CAP. Please contact me if you have any questions or would like to discuss this proposal in more detail.

Sincerely,

David Jones
Manager-Plants & Materials

---

[1] Williams, B.A., J.R. Willis, & J. Shacat (2020). *Annual Asphalt Pavement Survey on Recycled Materials and Warm-Mix Asphalt Usage: 2019, 9th Annual Survey* (IS 138). National Asphalt Pavement Association, Greenbelt, Maryland. https://doi.org/10.13140/RG.2.2.21946.82888.

[2] GHG emissions for 12.5mm HRC, which contains high RAP content, are 42.5 kg CO_2e/ton of mix. GHG emissions for 12.5mm NRC, which contains no RAP, are 48.2 kg CO_2e/ton of mix.

[3] National Academies of Sciences, Engineering, and Medicine (2014). *Field Performance of Warm Mix Asphalt Technologies.* Washington, D.C.: The National Academies Press. https://doi.org/10.17226/22272.

[4] Newcomb, D.E., J.R. Willis, & D.H. Timm (2010). *Perpetual Asphalt Pavements: A Synthesis* (IM-40). Asphalt Pavement Alliance, Lanham, Maryland. http://www.asphaltroads.org/assets/_control/content/files/Perpetual_Pavement_Synthesis.pdf

[5] Federal Highway Administration (2020). Improved Asphalt Pavement Sustainability Through Perpetual Pavement Design. FHWA-HIF-19-080. https://www.fhwa.dot.gov/pavement/sustainability/case_studies/hif19080.pdf.

[6] Dylla, H. & R. Hyman (2018). Boosting Pavement Resilience. *Public Roads*, Vol. 82 No. 3. FHWA-HRT-19-001. https://www.fhwa.dot.gov/publications/publicroads/18autumn/04.cfm.