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TRANSPORTATION RECOMMENDATION

Support and promote telework

Telework reduces Vehicle Miles Traveled (VMT) and therefore reduces greenhouse gas emissions from commuting to work, and reduces road congestion which can also result in less traffic and idling of cars. The COVID-19 pandemic brought telework into the mainstream of employment practices for all companies. The advent of teleconferencing software also allowed isolated employees to communicate virtually and continue to operate. As the 2020–2021 pandemic is brought to an end, telework will still be a resource that businesses can use to attract employees and address climate change in a positive fashion.

Telework strategies have an immediate benefit by substantially reducing auto commuting trips. The drop in VMT was experienced throughout the County during the pandemic, and impacted climate change by reducing auto-related pollution. Richard Griffin, Director of the Frederick Office of Economic Development, reported in the March 25, 2021 CEMWG meeting that at least one member of 54% of the City’s households telecommuted throughout the pandemic period, highlighting the potential impact telework has on emissions. In addition to reductions in VMT, telework aids families through increased flexibility, improves work/life balance via a reduction in time spent commuting, and saves costs associated with travel.

As the effects of the pandemic subside there will be a return to “business as usual” to some extent but telework options should be part of normal operating procedures going forward. There is no ideal model concerning time spent with telework vs. in the office. Schedules will vary based on job requirements, employee needs, and other factors.

“At least one member of 54% of the City’s working households telecommuted throughout the pandemic period.”

Richard Griffin, City of Frederick Office of Economic Development
Presentation using data from the Stephen Fuller Institute, George Mason University

Plans should strive for flexibility and as much telework as feasible.

Recommended actions:

- **Update County/City plans to increase telework** options where it is feasible for each job type.
- **Adopt lessons learned from the pandemic** and continue good practices that support remote access to government services, remote inspections, etc.
- **The County’s and City’s offices of economic development should encourage area businesses** to offer telework and create a Telework Directory of Businesses that feature telework opportunities.
- **Utilize the expertise and resources available** through the state’s newly created [Office of Telework Assistance](#). The bill that created this office also requires “each governing body of a county or municipality to establish telework programs.”

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Expected GHG Reduction or Climate Adaptation: Telework reduces vehicle miles traveled (VMT) and therefore reduces GHG emissions from commuting to work. Additionally, reduced VMT can also reduce road congestion, which can also result in less traffic and idling of cars. Results can be tracked through surveys of local businesses (e.g., through collaboration with the Chamber of Commerce) to identify the number of employees and hours spent teleworking.

Timeline for Action: Telework policies should be explored and public policies, if warranted, implemented immediately. Progress can be documented through listing workshops and outcomes with business owners, and time and support required to establish any future policy.

Rationale: The COVID-19 pandemic brought telework into the mainstream of employment practices for many companies. The advent of teleconferencing software allowed isolated employees to communicate virtually and allowed businesses to continue to operate. After the pandemic ends, telework will still be a resource that businesses can use to attract employees and simultaneously address climate change.

Telework strategies have an immediate benefit by reducing auto commuting trips by significant numbers. Between December 1, 2019, and March 31, 2020, there was a 30–40% drop in VMT in Los Angeles and Ventura counties according to Institute of Transportation Engineers (n.d.) data. Similar data were noted for Denver (Eshelman, n.d). The drop in vehicle miles traveled was experienced through the County during the pandemic. This is a benefit that impacts climate change by reducing auto-related pollution. Figure 1 provides the average reductions in traffic volumes in the Metro Washington, D.C. region due to the pandemic.

The magnitude of the decline in emissions from reduced VMT seems obvious, i.e. less gasoline consumed and hence lower CO2 generated.

However, there is considerable debate on the net change in GHGs due to cooling and heating, multiple small local trips, and daytime energy consumption in the telework site (Larson & Zhao, 2016; Cerqueira et al., 2020; Hook et al., 2020) but even small reductions in emissions are regarded as a necessary step for the changes in fossil fuel consumption needed.

The net effect on energy use from increased telework is complicated to estimate. The key is understanding the impact on office vs. residential building energy usage. While home energy use can increase with telework, office energy use should decline. Office declines would be less significant during the pandemic-induced telework since the offices did not go away, compared to planned, systemic telework, which should result in smaller office spaces and lower energy use. Home energy

Month and Year	Percent change in traffic volume from prior year
January 2020	+3.8%
February 2020	+2.4%
March 2020	-21.9%
April 2020	-50.5%
May 2020	-37.5%
June 2020	-25.5%
July 2020	-19.8%
August 2020	-19.2%
September 2020	-18.5%
October 2020	-17.4%
November 2020	-18.5%

Figure 1. Monthly Average Percent Change from Equivalent 2019 Month Regional Traffic Volumes Washington Metro Region (adapted from Meese, 2021).

Source: Metropolitan Washington Council of Governments Transportation Planning Board (Meese, 2021)

use increases should not be automatic nor large and will depend on several factors, such as whether or not there are already people at home during the work week, and the energy efficiency of the home. Someone who teleworks a significant portion of the work week may be encouraged to improve the energy efficiency of their home.

From an air pollution standpoint, telework should be a positive improvement. Reduced VMT from telework improves local air quality and reduces the number of pollution point sources (thousands of cars). Any potential uptick in building energy use (offices vs. homes) would result in emissions from fewer point sources with easier-to-apply pollution controls. It is also likely that some of the potential uptick in home energy use would be from clean renewable energy.

As the effects of the pandemic subside there will be a return to “business as usual” to a certain degree but telework will have to be part of normal operating procedures. There is no ideal model that is emerging yet concerning telework vs. in person, but some percentage of the work week will likely be done at home. The Livable Frederick Master Plan (Frederick County, 2019) supports exploration of telework and GHG reductions through its Transportation Initiative to, “Reduce greenhouse gas emissions tied to roadway congestion by working with regional employers to shorten or eliminate commute times by developing incentives for telecommuting, staggered work schedules, car and van pools, and shuttles for employees” (p. 195). The City Comprehensive Plan (City of Frederick, 2020) has outlined likely future increases in telework within the City, including broadband/internet needs (p. 1–45), and poses a similar commitment as noted for the County, “Work with partner jurisdictions and agencies to *support increased telework*, both by providing greater incentives for employers to adopt telework and by better advertising telework planning support” (p. 13–269).

Co-Benefits: In addition to reductions in VMT, telework aids families through increased flexibility, improves work/life balance via a reduction in time spent commuting, saves costs associated with commuting, improves air quality, and reduces GHG emissions, which will result in eventual regional public health improvements.

Equity Considerations: By reducing VMT, telework improves air quality, resulting in fewer illnesses associated with poor air quality. In addition, because many lower income individuals are employed in outdoor venues and jobs, heat-induced illnesses from the GHG-induced extreme heat events should decline as lower emissions lead to fewer extreme heat days, preventing lost days of work and income.

Cost and Cost-Benefit Analyses: Depending upon the nature of the organization, the infrastructure for remote work may already exist. Any needed increase or deployment of IT infrastructure to support remote work should be offset by reductions in needed office space. Therefore, from a cost perspective for governments and businesses increased telework should range from cost neutral to a cost savings.

Finance: The Coronavirus Aid, Relief, and Economic Security (CARES) Act provided 14 federal agencies with \$4.6B in new funding, a portion of which will be used for telework and telehealth requirements (Rossino, 2020). Maryland has an Online Sales and Telework Assistance COVID-19 RELIEF Grant Program as well. For increasing connectivity, there is Emergency Broadband Benefit funding now available (<https://www.fcc.gov/broadbandbenefit>) and multiple federal agencies (e.g. USDA, Department of Commerce, Department of Education and others) have a number of grant and loan options (see <https://broadbandusa.ntia.doc.gov/resources/federal/federal-funding> for the extensive list).

Recommended Actions:

- Update City and County plans to increase telework options where it is feasible for each type of job.
- Adopt lessons learned during the pandemic and continue good practices that support remote access to government services, remote inspections, etc.
- Continue to assess broadband needs throughout the City and County and seek federal and private investments to improve access until 100% of residents have dependable service.
- The City and County Offices of Economic Development should encourage businesses to telework and create a Telework Directory of Business that features telework opportunities.

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■ Utilize the expertise and resources available through the state’s newly created Office of Telework Assistance (<https://www.billtrack50.com/BillDetail/1255345>) to expand local telework options.

References

Cerqueira, E. D. V., Motte-Baumvol, B., Chevallier, L. B. & Bonin, O. (2020). Does working from home reduce CO2 emissions? An analysis of travel patterns as dictated by workplaces. *Transportation Research Part D: Transport and Environment*, 83(102338). <https://doi.org/10.1016/j.trd.2020.102338>

City of Frederick. (2020). *The City of Frederick comprehensive plan*. Frederick, MD. <https://www.cityoffrederickmd.gov/DocumentCenter/View/18902/2020-Comprehensive-Plan-adopted>

Eshelman, J. (n.d.). *How the COVID-19 pandemic changed work commuting in the Denver region*. Denver Regional Council of Governments. <https://drcog.org/sites/default/files/event-materials/Impact%20of%20The%20COVID-19%20Pandemic%20on%20Work%20Commuting.pdf>

Frederick County. (2019). *Livable Frederick master plan*. Frederick County Division of Planning and Permitting. Frederick, MD. <http://www.frederickcountymd.gov/DocumentCenter/View/319126/Livable>

Hook, A., Court, V., Sovacool, B. K. & Sorrell, S. (2020). A systematic review of the energy and climate impacts of teleworking. *Environmental Research Letters*, 15(093003). <https://doi.org/10.1088/1748-9326/ab8a84>

Institute of Transportation Engineers. (n.d.). *COVID-19 traffic volume deaths*. <https://www.ite.org/about-ite/covid-19-resources/covid-19-traffic-volume-trends/>

Larson, W. & Zhao, W. (2016, October 8). Telework: Urban form, energy consumption, and greenhouse gas implications. *Economic Inquiry*, 55(2), 714-735. <https://doi.org/10.1111/ecin.12399>

Meese, A. (2021, May 21). *COVID-19 impacts in metropolitan Washington*. Metropolitan Washington Council of Governments Transportation Planning Board. <https://www.mwcog.org/documents/2021/05/21/covid-19-impacts-in-metropolitan-washington-covid19-telework/>

Rossino, A. (2020, March). *Stimulus funding for telework and telehealth in the CARES act*. GovWin. <https://iq.govwin.com/neo/marketAnalysis/view/Stimulus-Funding-for-Telework-and-Telehealth-in-the-CARES-Act/4049>

Helpful links for implementation

[Federal News Network](#)

[One year into Covid, working from home is here to stay](#)

[Actually, remote working may not be the ‘new normal’ after all](#)

[The pandemic forced a massive remote-work experiment. Now comes the hard part](#)

[Working from Home — will we welcome the new normal? — The Oxford Student](#)

[Benefits of Maintaining Telework Policies — Local Government Commission](#)

[Appendix E: “Telecommuting: A Case Study in Public Policy Approaches”](#)

[The Promise of Telework](#)

[2020 ITE Developing Trends](#)

15 Study the feasibility of electric rapid transit bus service

Recommendation: Study the feasibility, cost effectiveness, and impact of implementing electric Bus Rapid Transit (BRT) routes from the County to key high-volume commuting destinations. The initial target system would be to connect Frederick County to the Shady Grove Metro Station.

Expected GHG Reduction or Climate Adaptation: Implementation of BRT routes has the potential to remove many vehicles from the roads targeted for this system. The scope of the impact is not available without further study. Results will include a comprehensive report in two years outlining the feasibility for electric BRT, detailing ridership, GHG emission reductions, and cost savings.

Timeline for Action: Study efforts should be started immediately. There are many opportunities for grant funding in this area. However, these opportunities can have short lead times for applying. Being prepared for opportunities that occur is therefore very important. Steps forward include defining the project plan scope and funding the plan's completion.

Rationale: With transportation the second largest sector in Frederick County for greenhouse gas emissions, reducing vehicle miles traveled (VMT) and making those miles less polluting is key to addressing climate change. Additionally, road congestion worsens the climate effect of VMT as it increases greenhouse gas emissions. Congestion mitigation, traffic smoothing, and other techniques can reduce this impact (Barth & Boriboonsomsin, 2008).

While dreams of extending the DC Metro system to Urbana or Frederick persist, this is extremely unlikely to occur. BRT routes between downtown Frederick and/or Urbana and the Shady Grove Metro Station are much more feasible projects.

BRTs have been explored for societal benefits in mobility and climate impacts as well. Major U.S. cities with established BRT systems are found in CA, CT,

OH, NM, OR, and PA (Global Traffic Technologies, 2019). For GHG emission reductions, using the International Energy Agency's (IEA) mobility model (2021), Trigg & Fulton (2012) noted that BRT's world-wide impact may lead to "...cumulative savings ... estimated to be 17–27% of CO₂ emissions in the transport sector by 2050. Annual savings of CO₂ emissions in the year 2050 are estimated to be in the range of 25–39%." The IEA projects that "BRT can contribute substantially to global CO₂ savings, potentially up to 0.5 GtCO₂ cumulative in the 2010 to 2050 time frame" (Trigg & Fulton, 2012). After comparing emissions from BRT and private cars, Imam and Jamrah (2012) concluded, "... that the use of BRT systems resulted in significant reductions in CO₂ emissions...". In Dublin, McDonnell, Ferreira, & Convery (2012) estimated that peak travel in a Quality Bus Corridor would reduce CO₂ emissions by 50% vs. without the corridor. Hence, BRT systems offer substantial promise for reducing GHG accumulations.

City and County plans document commitments to improving access to the metropolitan Washington, D.C. area. For example, the 1991 I-270 Corridor Cities Transit Easement — Frederick County Extension Study (n.d.) in the Livable Frederick Master Plan (Frederick County, 2019) identifies BRT as a possible transportation improvement option, even more beneficial now due to electrified buses and low-emission hybrid buses that could be employed to reduce transportation-generated GHGs. The Livable Frederick Master Plan also identified a BRT route (Interstate Corridor) along I-270 that would stimulate mixed use development along the route. The option is described in the Initiative: Capacity Expansion to "Improve and expand capacity in our transportation and public infrastructure systems..." by "Support(ing) expansion and improvement of local and regional multimodal commuter options, especially efforts to provide commuter relief along Interstate 270 in the form of *Bus Rapid Transit (BRT)*,..." (p. 100). The City

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Comprehensive Plan (City of Frederick, 2020) also supports a similar effort: “Enhance transit options including: Bus Rapid Transit (BRT) from Frederick to Gaithersburg, Shady Grove, North Bethesda, and Tyson’s corner (along I-270)” (p. 10–234).

Co-Benefits: The BRT reduction in personal vehicles on roads would eliminate the air pollution (volatile organics, NO_x, GHGs, and PM_{2.5}) from those vehicles with the associated health and environmental (e.g., water quality) benefits. With the use of electric buses, even more reductions and associated benefits would arise. Reduction in traffic volume and road congestion would improve every resident’s quality of life.

Equity Considerations: Many low-income populations rely on public transit or have vehicles that are unreliable or costly to operate. A BRT system that connected County residents to the DC Metro system could open job opportunities for people without adequate transportation resources. Subsidized fees for low-income riders should be considered. Transportation-dependent people, especially those with disabilities who require ADA accessibility, have no reasonably affordable transportation options to points south of Frederick, and a BRT system would be advantageous in connecting them to jobs and cultural and social opportunities the rest of the population takes for granted.

Cost and Cost-Benefit Analyses: The costs for such a system would need to be determined as part of a feasibility study. As an option to reduce congestion on roads such as I-270, a BRT system would almost assuredly be less expensive and faster to implement than other alternatives such as light rail or monorail systems.

Finance: The Maryland Department of Transportation offers Transit Innovation Grants to municipalities and transit systems in the state (Maryland Department of Transportation, n.d.). These grants can be used for a variety of activities including corridor studies, feasibility studies, and bus rapid transit corridors. There are also funding

opportunities at the federal government level (Federal Transit Administration, 2021).

Recommended Actions:

Before any BRT system can be implemented, the feasibility and implementation details need to be studied. Below are recommendations for proceeding from study to possible implementation. As part of these efforts, Frederick County should work with Montgomery County and the Metropolitan Washington Council of Governments. The Montgomery County Department of Transportation has experience with BRT systems in their county (2021).

- Start with an internal study with staff and knowledgeable citizens. Use this effort to develop grant proposals for a full feasibility study.
- Commission a full feasibility study, with grant funding if available.
- Implement any BRT system that study efforts deem useful and cost effective.

References

- Barth, M. & Boriboonsomsin, K. (2008). Real-world CO₂ impacts of traffic congestion. <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.367.5168&rep=rep1&type=pdf>
- City of Frederick. (2020). *The City of Frederick comprehensive plan*. Frederick, MD. <https://www.cityoffrederickmd.gov/DocumentCenter/View/18902/2020-Comprehensive-Plan-adopted>
- Federal Transit Administration. (2021, April 5). *U.S. transportation secretary Pete Buttigieg announces \$187 million in federal funding allocations for four bus rapid transit projects*. <https://www.transit.dot.gov/about/news/us-transportation-secretary-pete-buttigieg-announces-187-million-federal-funding>
- Frederick County. (2019). *Livable Frederick master plan*. Frederick County Division of Planning and Permitting. Frederick, MD. <http://www.frederickcountymd.gov/DocumentCenter/View/319126/Livable>

Global Traffic Technologies. (2019). *Top 6 highest rated BRT routes*. <https://www.gtt.com/top-6-brt-routes-2019/>

Imam, R. & Jamrah, A. (2012). Energy consumption and environmental impacts of bus rapid transit (BRT) systems. *Jordan Journal of Civil Engineering*, 6(3), 328-339. <https://platform.almanhal.com/Files/Articles/32502>

International Energy Agency (IEA). (2021). *The IEA mobility model: A comprehensive transport modelling tool aimed at improving the analysis of all the aspects of mobility*. https://docs.google.com/document/d/1UKj5lqj7zea0eTl6AX8_OBADqkEpLceW/edit#

McDonnell, S., Ferreira, S., & Convery, F. (2008). Using bus rapid transit to mitigate emissions of CO2 from transport, *Transport Reviews*, 28:6, 735-756, <https://DOI:10.1080/01441640802012920>

Montgomery County Department of Transportation. (2021). *Bus rapid transit project*. <https://www.montgomerycountymd.gov/brt/>

Trigg, T. & Fulton, L. (2012, January 22). *Bus rapid transit: cost and CO2 implications of future deployment scenarios*. Transportation Research Board 91st Annual Meeting. Washington DC. <https://trid.trb.org/view/1130223>