APPENDIX C: RESPONSE TO TRAFFIC REPORT SUBMITTED BY QACA

The Queen Anne's Conservation Association (QACA) submitted a report prepared by AKRF in December 2020 entitled *Chesapeake Bay Bridge Crossing Transportation Study* ("AKRF Report"). The stated purpose was, "[…] to conduct an independent study to determine whether there is a current need for replacement of the Chesapeake Bay Bridge Crossing from a traffic operations perspective." The report's Executive Summary states that the consultant reviewed and evaluated "methods, results, and conclusions stated in the Purpose and Need Assessment document dated February 2019." In addition, the Introduction to the AKRF Report states that "This report also considers and relies on results of comprehensive research efforts identifying strategies used at comparable facilities in the region, and available traffic data from MDOT on the Bay Bridge from 2003 to 2018. These findings are then also compared to traffic projections in the 2004 Transportation Needs Report and 2015 Life Cycle Cost Analysis Study." The AKRF analysis did not take into account information reflected in the Draft Environmental Impact Statement or the Bay Crossing Study (BCS) Traffic Analysis Technical Report, which were available in February 2021.

AKRF used the information available to the firm at the time of its report to:

- Develop a different set of existing traffic volumes than those used by the BCS team, perform its own capacity analyses using that set of existing traffic volumes, and prepare its own traffic forecasts using a different technique than used by the BCS team;
- Assess the likely impact of all-electronic tolling (AET) on eastbound traffic operations;
- Assess the potential impact of COVID-19 and increased telecommuting; and,
- Assess the potential impact of management strategies, including variable tolling and different management of the reversible lane.

These topics are addressed below.

Traffic forecasts, existing traffic volumes, and capacity analyses

Traffic Forecasts

The AKRF Report uses historic growth trends to forecast future volumes. The AKRF Report also suggests that one or more economic downturns "and the traffic growth-stagnating effects typically following them" should have been incorporated into the traffic forecasts.

Development of traffic volume forecasts through extrapolation from existing and historic traffic volumes is an approach often used in preliminary studies. One of the disadvantages with this approach is that its forecasts can vary substantially, depending upon the number of historic data points used and the length of time covered by those historic data points.

This disadvantage is avoided when a travel demand forecasting model is used. A travel demand forecasting model also explicitly recognizes that travel demand is based entirely on people: how many of them there are, where they live, and where they wish to pursue activities from working to shopping to recreating. Current traffic volumes, the current transportation network, current population and current employment are used to calibrate the travel demand forecasting model so that it reflects existing conditions. Then, forecasts of population and employment in a future year, along with anticipated changes to the transportation network in that year, can be used by the model to predict traffic volumes.

Traffic volume forecasts for the Bay Crossing Study were prepared using the Maryland Statewide Transportation Model (MSTM), a travel demand model prepared and maintained by MDOT SHA, which utilizes adopted long-term forecasts of population and employment. Those forecasts were developed cooperatively by County and Regional agencies, including Anne Arundel County, Queen Anne's County, and the Baltimore Metropolitan Council, and implicitly incorporate variations in economic growth during the intermediate years. The land-use forecasting approach used in the Bay Crossing Study is the approach typically used in a NEPA study and is consistent with FHWA guidance including *Instructions for Reviewing Travel and Land Use Forecasting Analysis in NEPA Documents*[1] (2018) and *Interim Guidance on the Application of Travel and Land Use Forecasting in NEPA*[2] (2010). Typically, in a NEPA study, forecasts of economic conditions in the analysis year are reflected in the forecasts of population and employment used to develop the travel demand forecasts.

Existing Traffic Volumes

The AKRF Report states that "only a one-day sample of data" from August 2017 was collected, that additional traffic data should have been collected, and that the data used were atypically high.

The Bay Crossing Study team collected seven days of traffic data for summer conditions, from August 1 through August 7, 2017. Additionally, because the Bay Bridge experiences both traditional weekday traffic peaks and summer weekend traffic peaks, an additional seven days of traffic data for non-summer conditions was collected. The average summer weekend volumes are a composite of Friday, Saturday, and Sunday volumes, and represent the highest volume in each hour during that three-day period. Additional information may be found in **FEIS Section 3.1.3**, as well as in Chapter 4 of the Traffic Analysis Technical Report.

Following MDTA's receipt of the AKRF Report, the Bay Crossing Study team reviewed Bay Bridge traffic data from June 2017 through August 2017. Examination of the data confirms that the total volume during

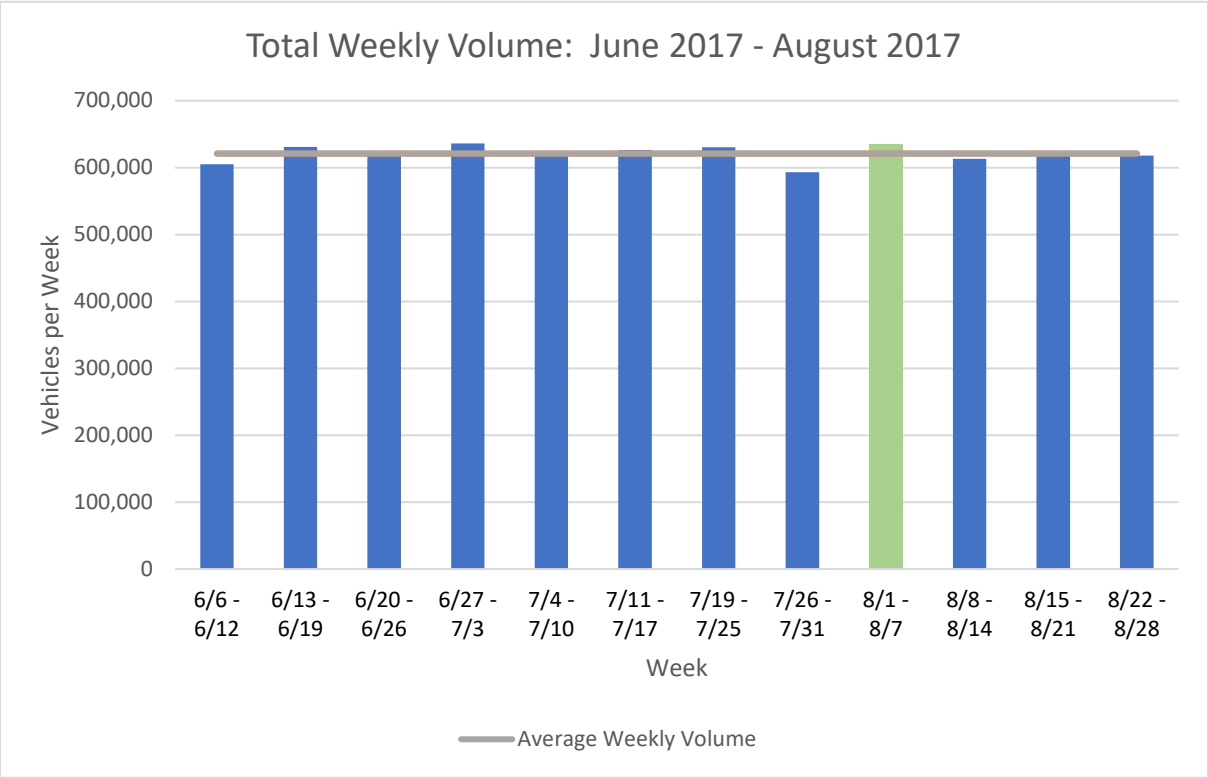
[1] https://www.environment.fhwa.dot.gov/nepa/Travel_LandUse/forecasting_reviewer_guidance.aspx
[2] https://nacto.org/docs/usdg/interim_guidance_on_app_of_travel_and_land_use_forecasting_fhwa.pdf

the week of 8/1/17 – 8/7/17 was slightly higher than the average weekly volume of the June – August period, but still representative of summer conditions and not abnormally high (**Table C-1** and **Figure C-1**). This variation from the average weekly volume is well within a range typically accepted in traffic engineering analyses. For example, in its "VISSIM Modeling Guidance" (August 2017), MDOT SHA requires that "The volume calibrations should not exceed 10% of the count traffic volume…" (page 14). The 2.29 percent difference noted in **Table C-1** and **Figure C-1** is well within this range. The volumes used appropriately represent existing conditions, and the analyses appropriately reflect existing conditions.

Table C-1: Weekly Traffic Volumes on the Bay Bridge, June – August 2017

Week	Total Volume (vehicles)	Percentage Difference from Average Weekly Volume
6/6/17 – 6/12/17	605,053	-2.56
6/13/17 – 6/19/17	630,773	1.58
6/20/17 – 6/26/17	622,043	0.18
6/27/17 – 7/3/17	636,035	2.43
7/4/17 – 7/10/17	617,775	-0.51
7/11/17 – 7/17/17	625,989	0.81
7/18/17 – 7/24/17	630,278	1.5
7/25/17 – 7/31/17	593,258	-4.46
8/1/17 – 8/7/17	635,161	2.29
8/8/17 – 8/14/17	613,146	-1.26
8/15/17 – 8/21/17	624,042	0.5
8/22/17 – 8/28/17	617,914	-0.49
Average	**620,956**	**N/A**

Figure C-1: Total Weekly Volumes on Bay Bridge: June 2017 – August 2017



Capacity Analyses

In the Introduction, the AKRF Report defines Traffic Congestion as "Hours of the day where the bridge traffic demand would exceed the traffic capacity in either direction of the crossing."

While congestion certainly does occur when demand exceeds capacity, congestion also can and does occur at volumes lower than capacity. As noted on page 7 of the BCS Purpose and Need Document, "While the computed capacity of the Bay Bridge in either the eastbound or westbound direction is up to approximately 4,900 vehicles per hour (vph), it has been observed that queues begin forming at demand levels at or less than 3,900 vph." In addition, there are a number of factors which can reduce the capacity of the Bridge on any given day including incident management, inclement weather and debris on the roadway surface.

Likely impact of AET on eastbound traffic operations

The AKRF Report cites the AET Conversion and Prioritization Study (January 2014), which stated that AET could lead to a significant reduction in delays and queuing at all MDTA facilities with toll barriers, including the Bay Bridge.

As stated in the 2014 AET Study, "the VISSIM analyses conducted for the [2014] AET Study did not include the US 50/US 301/Bay Bridge. The Bay Bridge was the subject of an earlier and much more detailed VISSIM analysis performed in 2008 as part of a larger study evaluating all electronic tolling at the Bay Bridge." The 2008 analyses, which are summarized in the 2014 Study, indicate that removal of the toll plaza would be expected to increase the capacity of eastbound US 50 by approximately 4.4 percent between Oceanic Drive and the foot of the Bay Bridge. That increased capacity would be expected to decrease queues and delays. With the volumes used in the 2008 analyses (which were approximately the capacity of the Bay Bridge itself) and the three-hour analysis period used in the 2008 analyses, those reductions would be expected to be as described in the 2014 AET Study. However, queues and delays would not be eliminated, due to the capacity limitations of the Bay Bridge itself. With higher volumes and/or longer analysis periods than those used in the 2008 analyses, longer queues and more extensive delays would be expected, and in fact continue to occur with AET fully implemented at the Bay Bridge.

As explained in **Section 3.1.2.1 of the DEIS** (Transportation Systems Management/Travel Demand Management (TSM/TDM)):

Implementing All Electronic Tolling (AET)

This improvement includes replacing the existing toll booths with an overhead toll gantry that collect electronic tolls at highway speeds. AET commenced at the Bay Bridge in Spring 2020. Following completion of the Draft Tier 1 EIS, and prior to the preparation of the Final Tier 1 EIS, additional data collection will be performed to evaluate the effects of AET on eastbound operations.

The results of this data collection and evaluation effort show that queues are still occurring on eastbound US 50 approaching the Bridge, as described in **FEIS Section 3.1.2**.

By eliminating the need for vehicles to slow or stop to pay their toll, AET can reduce or even eliminate delays and queuing at the Bay Bridge when low to moderate volumes are present; that is, when the capacity of the Bridge does not constrain traffic flow. However, as volumes approach the capacity of the Bridge, queues and delays still occur, even with AET.

It should also be noted that while consideration of queue lengths in the eastbound direction is an important metric, the AKRF Report excludes consideration of westbound queues, which are also important to the operation of the Bay Bridge.

Potential Impact of COVID-19 and Increased Telecommuting

The AKRF Report states that "The long-term influence of the COVID-19 pandemic on traffic and travel patterns is not yet understood."

MDTA agrees with this statement. The COVID-19 pandemic has had an impact on both weekday and weekend travel patterns throughout the nation, including at the Bay Bridge. The short-term impacts of the pandemic continue to evolve, and it is too soon to define or to accurately assess the long-term impacts at this time. That being said, following the end of most COVID-19 restrictions in Maryland in mid-May 2021, volumes at the Bay Bridge have generally increased, with volumes during July 2021 exceeding pre-pandemic levels. The potential impact of COVID-19 on current traffic volumes and traffic forecasts is discussed in **FEIS Section 3.1.1**.

The AKRF Report also suggests that increases in telecommuting could result in lower future traffic volumes than are forecast.

Future impacts of telecommuting are uncertain at this time. If a Tier 2 Study is performed, new "existing conditions" traffic volume data would be collected, and any impacts of telecommuting on weekday or weekend traffic at that time would be reflected in that data. Longer-term impacts of telecommuting would be addressed in the travel demand forecasting for a Tier 2 Study.

Potential Impact of Management Strategies, Including Variable Tolling and Different Management of the Reversible Lane

With regard to the management strategy of variable tolling, the AKRF Report identifies I-66 in suburban Washington DC and bridges/tunnels between New York and New Jersey as "comparable facilities in the region" and suggests that reductions in peak traffic volumes as a result of congestion pricing at those facilities could apply to the Bay Bridge.

Several unique factors make comparisons of other facilities in the region to the Bay Bridge challenging. In particular, to be directly comparable to the Bay Bridge another facility would need to a) be the sole link in the bridge/roadway system at/near that location; and b) experience both non-summer weekday and even more extensive summer weekend congestion. Neither I-66 in Northern Virginia nor the bridge/tunnel crossings between NY and NJ meet these criteria.

In addition, the goal of congestion pricing is to shift traffic volumes from peak periods to off-peak periods. While this would help peak period congestion, it would not support the project need to provide "flexibility to support maintenance and incident management in a safe manner", by increasing volumes during off-peak periods and potentially reducing the number of off-peak hours during which lane closures could be accommodated.

With regard to different management of the reversible lane, the AKRF Report identifies high occupancy vehicle (HOV) or high occupancy toll (HOT) lanes as a possible strategy to reduce demand at the Bay Bridge.

Both variable tolling and HOV/HOT lanes are Transportation Systems Management/Transportation Demand Management (TSM/TDM) strategies, which would be further considered in a potential future Tier 2 Study, in the context of Corridor 7. This would include the evaluation of all Modal and Operational Alternatives (MOA) during any future Tier 2 alternatives analysis.

Conclusion

In conclusion, the issues raised by the AKRF report have not brought to light information that would change the identification of Corridor 7 as the PCA or undermine the basis of the Purpose and Need. The updated traffic analysis showed that the overall results of the traffic analysis and underlying assumptions are still valid.