Response to Comments by the reviewer

Itemized Comments and Responses

Comment	Response
The executive summary is not included in the report	▪ Thanks for your comments. ▪ It is not the typical format of the SHA's report. The executive summary has been included in the 2-page summary.
The current format of the report aligns with an academic report, and it needs to be in a MDOT technical report format	▪ Thanks for your comments. ▪ The report has followed the standard SHA research report (not the consulting report) format.
The 2-page summary needs more details on findings on the study	▪ Thanks for your comments. ▪ We cannot include more details due to the page limit constraint.
We would like to schedule a meeting with UMD for them to present the report	▪ Thanks for your comments. ▪ Please be specific for the meeting focus (e.g., the detection algorithm, report presentation, etc.) so we can better prepare for the meeting. The technical parts and results have been presented at the last project meeting. We can provide a training meeting for potential users to learn how to apply our developed software to perform detector quality analysis.
Some statements and relevant figures are disjointed	▪ Thanks for your comments. ▪ We have done a review again and correct all changes we deem necessary.
How data was collected using drones and what was the duration of data collection	▪ Thanks for your comments.

	▪ The step-by-step procedures of using the drone to collect data have been stated clearly in **"Section 2.2 Detector Accuracy Evaluation**", with each step supported with a schematic figure. ▪ The duration of data collection is **one hour** for each location, such information will be further added to **Appendix-B** of the report ▪ Below statement has been added to the "Evaluation Method" section in Appendix-B on page 71: • *Data Collection Duration* o *One hour for each location*
What is the accuracy of data collected by drone Vs a roadside camcorder?	▪ Thanks for your comments. ▪ The volume data can be validated via the manual count, while the speed data has been validated by comparing with the measurements by the speed gun. It is shown that both offer more than 95% accuracy if operated properly, and professionally.
Page 7 table 2.1: Why does only lane 3 have erroneous numbers, was any analysis done for erroneous data? Is there any reporting mechanism for errors or failures?	▪ Thanks for your comments. ▪ It was caused by the presence of the median, but the accuracy level remains sufficient for typical traffic control and operations except for real-time and adaptive controls.
What are dos and don'ts for optimum locations?	▪ Thanks for your comments. ▪ The sensors at their optimal locations are expected to be cable of performing the designated functions such as monitor traffic and collect information for traffic control. Different sets of optimal locations for different functions are presented with different icons.
Page 42 bullet 4: What defines the ideal location?	▪ Thanks for your comments.

	▪ The ideal traffic monitoring sensor locations are expected to be capable of detecting all traffic streams feeding towards the congested segments. ▪ The ideal locations for identifying congestion patterns are expected to cover all areas within the spatial evolution range of a congestion pattern.
Page 46, Paragraph 1: Rather than referring to mounting sensors on signal poles, should also refer to mounting height. Also, are signal poles really good locations for deploying sensors, we could use traffic signal detectors data and deploy sensors at some other candidate locations	▪ Thanks for your comments. ▪ The concern of mounting height is not applicable to the Eastern shore region and not within the scope of this study ▪ If an optimal location is identified at an intersection, using the signal detectors can be a viable alternative, provided that they can provide high-quality data of traffic volume and speed. In addition, we should note that only a very limited number of detectors are available within the Eastern Shore area.
Page 51: Chapter 3 is inserted in chapter 4 and needs correction	▪ **Thanks for your comments** ▪ **Please be specific.**
Recommendations for sensor deployment seem to be thoughtfully selected. Broken-down in segments is fine but, a bigger picture of the complete corridor will be helpful	▪ This is our no-cost extension of supplemental work to indicate the potential extension of this project, based mostly on the sensor locations proposed by SHA, for future deployment, which is not the focus of this project for assessing the quality of existing sensor data and development of a software to do the task. ▪ In addition, the sensor locations are determined for each congestion cluster, which is shown in Figure 4-1. However, displaying sensor locations on such a large-scale map will show overlapped icons and could not provide more precise information.
Page 54 paragraph 2: D01 is referred to being part of fig 12 but it is in figure 13	▪ Thanks for your comments. ▪ Paragraph 2 on page 54 has been revised as below: *The analysis results, as shown in Figure 4-13, indicate the need to deploy at least one detector at D01 for monitoring the traffic volumes and speeds entering this segment. However, it would need additional five detectors placed at the identified*

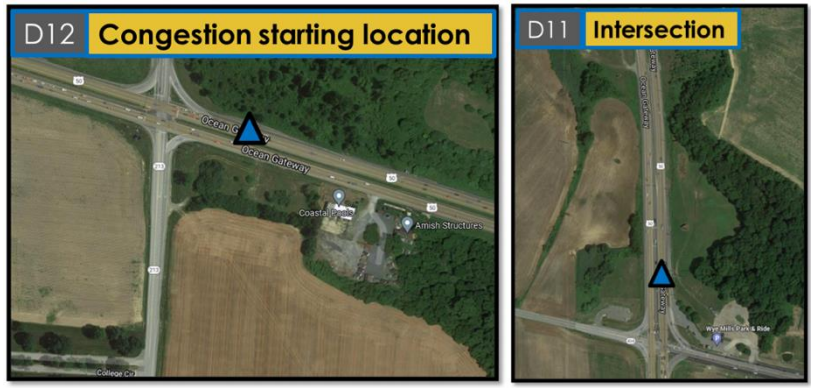
	roadside locations (i.e., D02-D05 and D12) and at intersection D11 to fully capture the time-varying evolution of congestion patterns, and also to design either reversed arterial signal progression strategies or dynamic speed control plan for congestion mitigation. Figure 4-12 further shows the geometric features of the two intersections, which are the bottlenecks for this area. The precise locations for detectors to monitor the flow patterns at these two congested intersections are also shown in Figure 4-13. Figure 4-12 has been revised as below:  Figure 4-12: Geometric features of the two congested intersections and suggested locations for detector deployment
Fig 4-10, C12, C13 & C15 are not properly marked on the map and so is fig 4-12 and more	▪ Thanks for your comments. Relevant figures have been revised to mark those locations clearly. ▪ Figure 4-4 has been revised as below:

Figure 4-4: Detector locations selected for different application needs

Figure 4-10 has been revised as below:

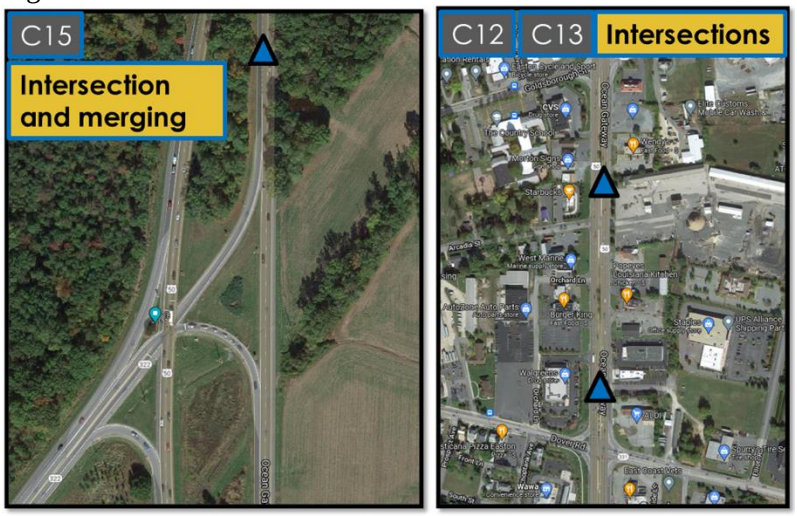


Figure 4-10: Examples of detector deployment for monitoring turning traffic volumes at major intersections

Figure 4-14 has been revised as below:

Figure 4-14: geometric features of the two locations (C16 and C17) for detector placement