# Research Need for Operations and Maintenance Technical Advisory Group

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1. **Issue Identified:**

   Bridging Transportation Operators' Real-Time Information Gaps

2. **Summary of Problem:**

   There is sometimes a substantial gap between highway conditions on the ground and highway operations' awareness of those conditions. As a result of this gap, responders are sometimes delayed. In addition, incident responses may be excessive, wasting or misdirecting response resources, or insufficient, leaving responders unprepared for the scale of an incident.

   There is, of course, a lot of information available regarding incidents. The information might include congestion heat-map data, information from public-safety answering point dispatchers, *999 motorist reports for the Illinois Tollway, motorist reports via the Waze app, or cameras at select interchanges, intersections or critical corridors. However, this available incident information is often quite general and requires on-site personnel to assess conditions adequately.

   Information from dashcams, if available to dispatchers, might help fill the information gaps described above and address shortcomings in existing information sources. Some vehicle manufacturers record front-facing camera images, and these images might be used for public safety purposes. Wisconsin, among other highway operators, is starting to work with information providers to use real-time dashcam information. Wisconsin's system allows highway operators to view dashcam images to see the latest conditions within identified geofenced areas around incidents or hazards. For Illinois, there is a need to expand the use of this technology to identify incidents and give highway operators near-real-time images of the incident to appropriately scale their response (i.e., traditional or intelligent transportation system responses such as changing advisory speeds).

3. **Desired Results/Outcome:**

   A potential research project would develop incident-identification algorithms using dashcam images available from companies such as CompassIoT. Some of this work may already be underway, but the research could expand existing efforts to include dust or sand blowing on highways, snow and ice, fog, water on pavement, as well as human-generated incidents

such as illegal or hazardous truck parking, railroad gate-down conditions, back-of-queue congestion on expressways, and pedestrians on expressway shoulders.

Ideally, the research could be extended to include an evaluation of whether dashcam image processing provides incident information to highway operators faster than traditional methods, whether the availability of real-time dashcam images improves the scale of the response (perhaps judged by an expert panel), and whether clearance times are improved.

A final extension of the research might be an evaluation of potential systems to develop fully automated algorithms to identify incidents using dashcam images and automatically initiate responses to mitigate hazards. Incidents can include a mix of those described above, but the responses might include reduced advisory speeds transmitted through fixed assets (signs in place) or digital warnings to approaching drivers.

This research would build on existing peer-reviewed research and present numerous opportunities for additional extensions and solutions focused on Illinois conditions and highway needs.