Pettitt, M., Burnett, G., & Stevens, A. (2007). An extended keystroke level model (KLM) for predicting the visual demand of in-vehicle information systems. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '07* (pp. 1515–1524). New York, NY, USA: ACM. doi:10.1145/1240624.1240852

In this article, the authors devised an extended KLM for use in predicting the visual demand of in-vehicle information systems, such as GPS navigation systems. The authors began by summarizing the ways that such systems have been tested in the past. In particular, they discussed the use of the occlusion technique, where the user's vision is occluded through the use of goggles that open and close for regular lengths of time, intending to mimic the way a driver glances back and forth between the road and the object of attention. Some important calculations in occlusion testing are the Total Shutter Open Time – that is, the sum time the user is looking at the device or interface, and the resumability ratio, which measures the degree to which a task can be done without visual control. The resumability ratio predicts the extent to which the user can return to the task after distraction. The limitation of occlusion testing was that it requires a relatively high-level prototype, which means that any necessary changes to the interface discovered during the testing might not be implemented because design would be too far advanced.

The authors suggest that the KLM could be extended to use in this testing context. They developed a KLM that used the recognized times for various actions, with the addition of a reach far method, for the user's initial movement to the GPS screen. The authors assessed their KLM against the occlusion timeline, using various assumptions about how the occlusion would affect the user's ability to complete the task, such as that an operator could probably continue a task during a period of occluded vision, but could not initiate a task at that time. They ran straight occlusion tests of two different navigation systems, and compared those results with their extended KLM, and found a strong correlation in the results. They did acknowledge that there might be a need to develop additional operators, as they called the actions, for use in predicting task performance for in-vehicle information systems.

Another application of this KLM could be in the testing of cooking apps on the iPad. The circumstances of abstracted attention are similar (if not quite as critical with the cooking apps), as are the KLM operators. The KLM might also be useful in testing touch screen devices in other machinery, such as devices on the bridge of a merchant ship or on a loading crane. Visual distractions will likely increase as more and more functionality is included in contexts where users traditionally were able, or required, to concentrate. It is important to devise evaluative methods that consider elements like levels of distraction, and the way distractions affect performance with the device or interface.