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Simulation study of traffic pattern at Shiretoko National Park in Japan
(知床国立公園における交通パターンのシミュレーション研究)

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Shiretoko National Park is one of the three World Natural Heritage sites in Japan. After the 2005 designation, the number of tourists visiting the park increased by more than 20%. This increased popularity has led to heavy traffic jams. For example, during summer and autumn holiday seasons, long waiting queues, sometimes longer than 2km, are formed at the parking of the Shiretoko Five Lakes, the most visited sight seeing spot in the park. Despite this situation, the Japanese Ministry of the Environment and the local community plan to introduce two new systems that might worsen the current situation: (i) The first one is the “guiding system”, which intends to mitigate human-bear conflicts, by requiring tourists to hire a registered guide who will guide and protect tourists through the small trails in the Shiretoko Five Lakes. (ii) A relaxed regulation for private cars, which will open the access to places currently closed to private cars, the Kamuiwakka waterfall. Here we use a cellular automata (CA) model to predict impacts of these two new systems on the future traffic patterns in Shiretoko and provide useful guidelines for management and regulations. Our results show that the system would cause serious traffic jam toward the Kamuiwakka waterfall. However, the jam can be reduced significantly by slight increase of parking capacity, and controlling inflow without reducing number of visitors.

Key Words: *traffic jam; Cellular Automata (CA); park management; Shiretoko National Park*