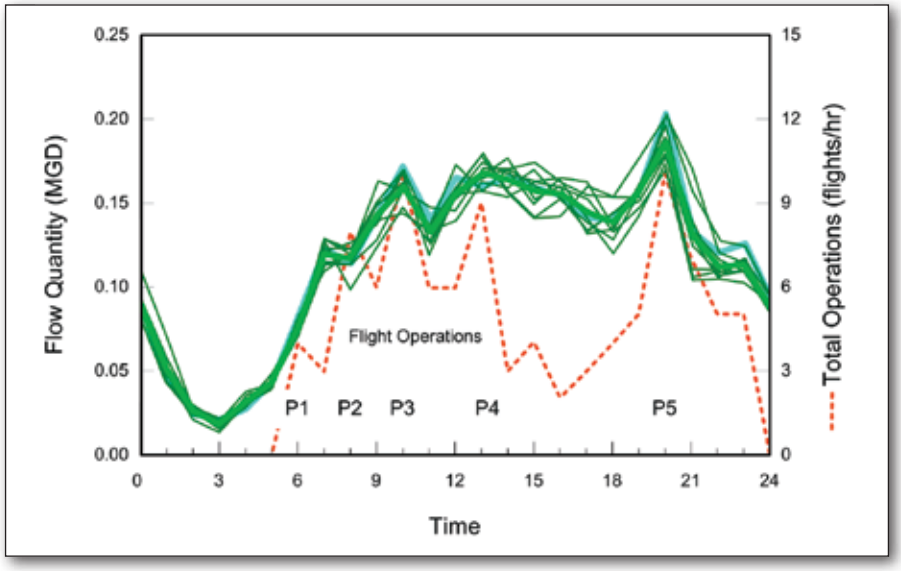
Flight 8873, you are cleared for takeoff

Kevin L. Enfinger and Patrick L. Stevens

sew´·ẽr sō·ci·ol´ō·gy, *the science of society, social institutions, and social relationships viewed through the eyes of a sewer; specifically, the systematic study of the development, structure, interaction, and collective sewer use of organized groups of human beings.*

Most sewer flows are characterized by repeatable diurnal patterns that vary across weekdays, weekends, and holidays. Differences in land use also are apparent, and distractions and disruptions of daily life often can be observed.

Sewer use at an airport terminal



This month, we take a look at airport operations through the eyes of a sewer.

Airline passengers are well acquainted with the "spoke-and-hub" system operated by major airlines. Each hub serves as a transfer point for groups of flights from outlying airports, the spokes. When a group of airplanes lands, passengers scurry about to board connecting flights, and all of the airplanes depart again for other airports.

This process is known as a "pulse," and most hubs experience about five pulses per day. A traveling sewer sociologist naturally will ask, "I wonder if these pulses can be seen in airport sewer use data?" We had the same thought and decided to take a look.

The figure shows a composite hydrograph of sewer use at one terminal in a major West Coast airport. Weekdays are shown in green, and weekends are shown in blue. Total flight operations (arrivals and departures) are shown in red with five pulses or spikes.

Note that sewer flows begin to increase prior to the first two pulses of the day; these flows are attributed to the morning's departing passengers. Subsequent pulses have concurrent increases in sewer flow and represent a combination of contributions from both arriving and departing passengers.

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