sew´·ẽr sō·ci·ōl´o·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.*

The Diurnal Drive

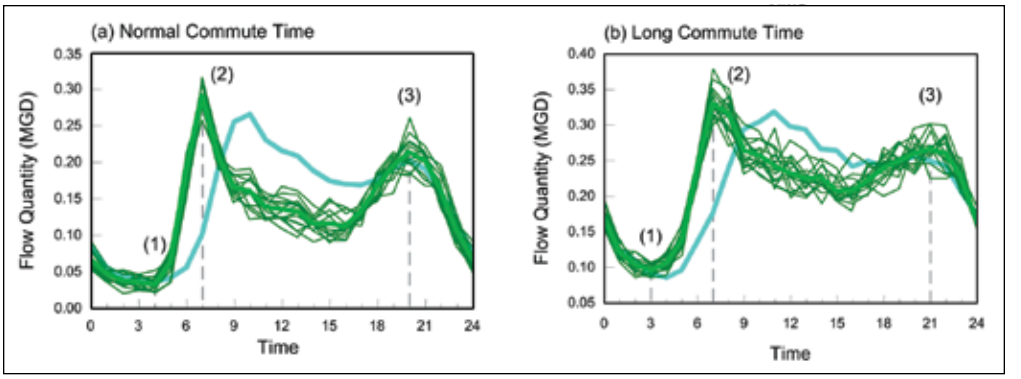
Kevin L. Enfinger and Patrick L. Stevens

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. This month, we take a look at the daily commute and see how it affects the typical residential sewer use pattern.

A few months ago, the U.S. Census Bureau released its annual update of the areas with the longest average commute times. It turns out that an investigation of sewer use data reveals some differences between areas with average and long commutes.

The figure below shows a composite hydrograph of flow-monitor data from a residential area with a normal commute time (a), and a composite hydrograph from a residential area with one of the top five average commute times in the country (b). Weekdays are shown in green, and weekends

Effect of Commute Time



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are shown in blue.

At first glance, the two sewer use patterns appear the same. However, a closer look yields three key observations.

First, the start of the morning rise (1) — when the "early birds" awaken — begins at about 4 a.m. for a typical residential area. However, in areas with a higher concentration of "extreme commuters," the start of the morning rise (1) can occur as early as 3 a.m.

Second, with the start of the morning rise occurring an hour earlier in areas with longer commutes, one might also expect the morning peak flow (2) to occur earlier as well. However, this is not the case. The morning peak flow (2) for both regions occurs at 7 a.m. While the extreme commuter may get up early for his or her morning commute, the rest of the family often does not. They are more likely to work and go to school locally; hence, their morning schedules are not affected by the long daily commute of a spouse or parent.

The final difference appears in the timing of the evening peak flow (3) — it occurs 1 hour later where the extreme commuters live. Perhaps this is an indication that some families may delay the evening meal and bedtime preparations to allow time for a commuting parent to return home.

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Looking Ahead

Coming up in the March issue …

Taking Control of CSOs

Long-term programs to manage combined sewer overflows (CSOs) often cost billions of dollars and entail 10- to 20-year implementation periods. Learn from two major cities' experiences in applying 21st century approaches and technologies to 19th century infrastructure. Then, read how a third city remediated a very large, active CSO in order to proceed with its ambitious waterfront redevelopment plan.

Creative Odor Controls

Wastewater treatment plants battle hydrogen sulfide to protect neighbors from odors, operators from hazards, and pipes from corrosion. Meeting those challenges can be difficult, and often requires resourceful solutions. The March issue will cover how a routine repair to a treatment plant's enclosed trickling biofilter odor control system prompted an entire new set of rules for keeping operators safe. Readers also will learn how one utility used modeling software to refine its corrosion inspections, saving $350,000.

Also in this issue:

- **Pump Restoration.** Better performance through refurbishment and epoxy coating.
- **Public Outreach.** Building a community-based watershed group from the ground up.

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