

Making Staff Schedules Meet Jail Coverage Needs: *Don't Let the Tail Wag the Dog*

By Rod Miller and John Wetzel,

This is the seventh article of a series on jail staffing analysis, exploring the methodology developed by the National Institute of Corrections and presenting enhancements developed since NIC's latest workbook¹ was published. This article begins our examination of the critical and sensitive process of developing and evaluating staff schedules.

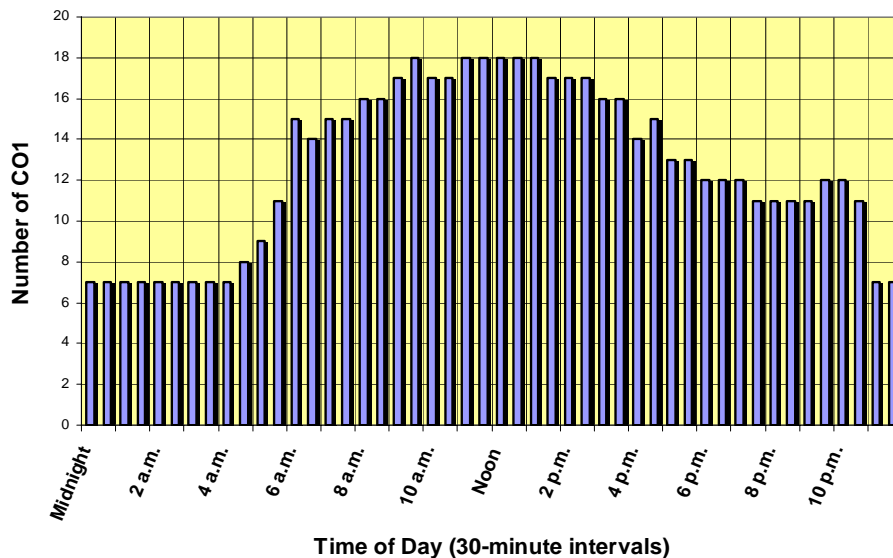
A good schedule efficiently meets jail coverage needs, but schedules often take on a life of their own and begin to drive operations, rather than respond to operations. We have encountered many jails where the schedule is the tail that is wagging the dog, by forcing operations to adapt to the schedule.

Coverage plan is the foundation on which the schedule is built

In an earlier article we urged readers to “think outside the schedule” and determine coverage needs without regard to scheduling issues. The result will be a coverage plan that reflects the varying needs for staff, hour to hour, day to day.

Form C from the NIC workbook develops a detailed coverage plan that looks at jail operations and staffing (coverage) needs for every 30-minutes during a week. Figure 1 shows a graph that is generated by Form C to display the ups and downs of coverage needs.

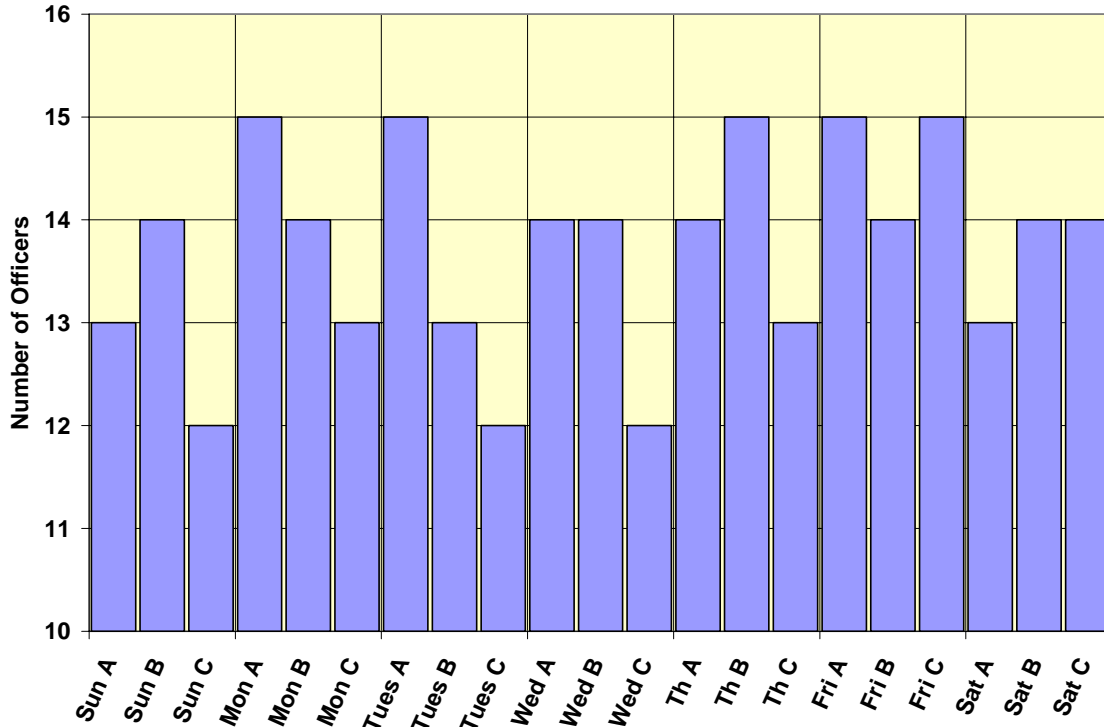
Figure 1: Sample 1-Day Coverage Plan Using 30-Minute Increments



¹ **Staffing Analysis Workbook for Jails**, First Edition. Rod Miller and Dennis Liebert. National Institute of Corrections, Washington D.C. 1987. Second Edition published 2003. The NIC methodology has been embraced by jails throughout the United States and has also been adopted by police, fire, transportation, health care and nursing home operations.

Using 30-minute or 60-minute units to examine coverage gives your pencil a fine point as you describe the ups and downs of daily jail operations and coverage needs. But for this article, we will pull back a bit further and look at larger units in order to simplify our explanation of the relationship between coverage and schedules. In Figure 2 is an example of a simplified coverage plan for a week that uses 8-hour shifts (A, B, C) to define coverage needs.

Figure 2: Simplified 7-Day Coverage Plan Using 8-Hour Shifts



In the last article we suggested that Step 7 (Evaluating) should come before Step 6 (Scheduling). Schedules allocate individual staff members to specific time periods and days of the week, while coverage needs (Step 5) represent what is really *needed* in the jail at a given time and provide the foundation on which an efficient schedule may be developed. Before taking the time and expense of developing a schedule, and possibly raising the concerns of employees, it makes sense to be sure you have a solid consensus of coverage needs.

Evaluating Current and Potential Schedules

Coverage Plan Is Key

How do you know whether your current schedule, or one you are considering, is appropriate? The starting point is to compare the *actual* deployment of staff according to the schedule to the *coverage* needs that you have previously identified. A good schedule provides the right numbers and types of staff, at all times, to meet identified coverage needs.

There are other considerations that contribute to the evaluation of a schedule. We suggest that schedules must be:

- *SUFFICIENT*. Providing at least as many staff for each hour of each day that has been determined in the coverage plan (and the right *type* of staff). The schedule should never assign fewer staff than are required by the coverage plan. Some jurisdictions refer to coverage needs as their “minimum” levels of staff, below which they cannot safely operate.
- *EFFICIENT*. Minimizing the number of “extra” staff deployed by the schedule (“extra” staff are the ones scheduled to work above the number required by the coverage plan).
- *CONSISTENT*. Minimizing variations throughout the schedule cycle.
- *ATTRACTIVE* to employees by meeting their needs, being considerate of their personal preferences, and offering incentives to stay with the organization.
- *HEALTHY*. Promoting staff physical well-being and performance.

We explore each of these evaluative perspectives by posing the questions that follow.

Is the Schedule Sufficient?

You cannot answer this question accurately without a coverage plan. But once you have one, you have an ideal tool to identify every instance that your schedule falls short of coverage needs. When you developed your coverage plan you identified the number and types of staff needed using a spreadsheet. This provided the basis for the mathematical calculations that are needed to determine the number of full-time-equivalent (FTE) staff needed in the budget. This spreadsheet technique proves just as effective and accurate when it comes to schedules. With this article, we introduce a new tool to be used to that end, which we will call “Form E.”²

Most jails operate with three, 8-hour shifts, or two 12-hour shifts.³ Although we have developed a version of Form E that uses 30-minute increments to examine coverage and schedules, we will use another variation-- using shifts as the unit of measure-- to illustrate the larger picture in this article.

To evaluate the sufficiency of a schedule according to shift assignment levels, Use Form E to identify the work days and off days for each staff member assigned to a shift. Use a “1” to record a work day, and a “0” (the number zero, not the letter o) to record a

² The NIC workbook provides forms A through D, therefore E is the logical label for this new tool.

³ Many jails use variations of 8-hour shifts to tailor scheduling to coverage needs, sometimes lengthening the shift beyond 8 hours, sometimes by moving the start- and end-times of a shift, or a combination of these techniques.

scheduled off day. Figure 3 provides a sample of Form E, using a shift that has 20 staff assigned to it.

Figure 3: Sample Form E - Excerpt (Top of Form)

Staff Member Code	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Total Days Worked
1	0	1	1	1	1	1	0	5
2	0	0	1	1	1	1	1	5
3	0	1	1	1	1	1	0	5
4	0	1	1	1	1	1	0	5
5	0	1	1	1	1	1	0	5
6	0	0	1	1	1	1	1	5
7	1	0	0	1	1	1	1	5
8	1	0	0	1	1	1	1	5
9	1	1	0	0	1	1	1	5
10	1	1	0	0	1	1	1	5
11	1	1	1	0	0	1	1	5
12	1	1	1	1	0	0	1	5
(continue until all staff are shown) ▼								

1 = work day 0 = day off

When you are finished recording the work and off days for each employee, add the numbers in each column to determine how many persons are scheduled for each day (A). Enter the totals from the coverage plan below the scheduled coverage figures (B), and then calculate⁴ the difference (C) between scheduled staff and coverage needs with this simple formula:

Scheduled Hours <i>minus</i> Coverage Hours = Difference (plus or minus)

Figure 4 provides a sample of the bottom of Form E. This technique produces *quantifiable* results. A template for Form E is provided, along with this sample, at our national clearinghouse (www.staffinganalysis.com).

When the schedule falls below minimum coverage needs, the difference (C) will be a negative number. When the two numbers match, your schedule has efficiently provided the right number of staff to meet coverage needs. When there is a positive number, your schedule provides more staff than you have determined are needed. In others words, when the difference between scheduled hours and coverage hours is:

- a negative number, your schedule is *insufficient* to meet coverage needs
- a positive number, your schedule *exceeds* coverage needs
- zero, your schedule *matches* coverage needs

⁴ Form E has this, and other formulas, embedded in the template.

Figure 4: Sample Form E - Excerpt (Bottom of Form)

Staff Member Code	Sun	Mon	Tues	Wed	Thur	Fri	Sat	Total Days Worked
1	0	1	1	1	1	1	0	5
▼								
19	1	1	1	1	0	0	1	5
20	1	1	1	1	1	0	0	5
A. Total Scheduled	13	15	15	14	14	15	14	100 shifts scheduled
B. Total Coverage Needed	12	16	14	13	14	14	15	98 shifts needed
C. DIFFERENCE (B minus A)	1	-1	1	1	0	1	-1	2
D. Shortfalls (Schedule is <u>less</u> than coverage needs)		-1					-1	-2
E. Excess (Schedule is <u>over</u> coverage needs)	1		1	1		1		+4

Note that Form E posts negative numbers in one row, and positive numbers in another. This is necessary to ensure that you generate a separate count of positive and negative number, and not to combine them. The grand totals on the form indicate the number of hours under, and over, for the cycle.

The spreadsheet also provides the ability to *graphically* identify the hourly relationship between the schedule and coverage needs. The chart in Figure 4 was drawn from Rows A and B at the bottom of the spreadsheet. Whenever the schedule line falls below the coverage line, there is a problem with sufficiency.

At this point you may be wondering why the scheduled hours vary as they do. After all, if you schedule X staff for a shift, doesn't that always deliver X staff? The answer is "not *always*." Depending on several characteristics of your schedule, the number of assigned staff will vary-- sometimes markedly-- from day to day, and often from week to week. We will examine the math and mechanics associated with schedules in our next article.

Figure 5: Chart from Form E- Coverage and Schedule for 1 Shift, 1 Week

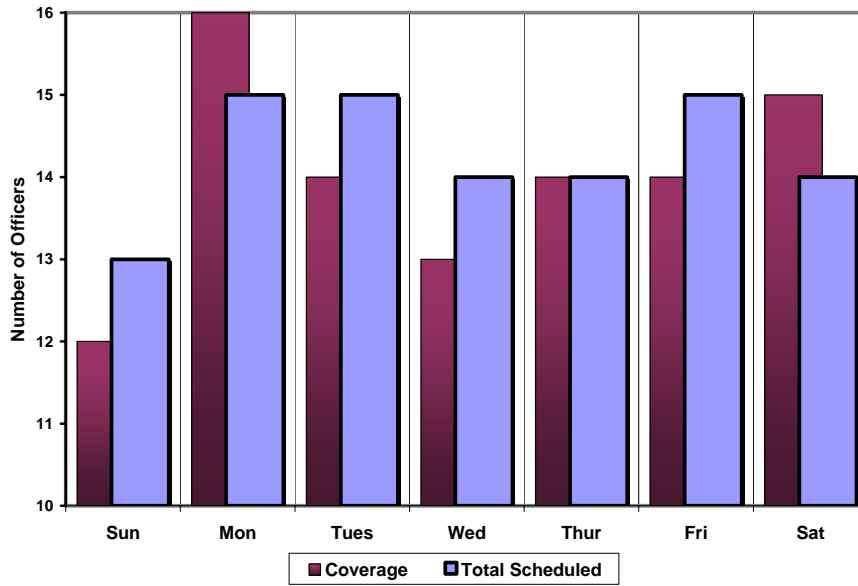
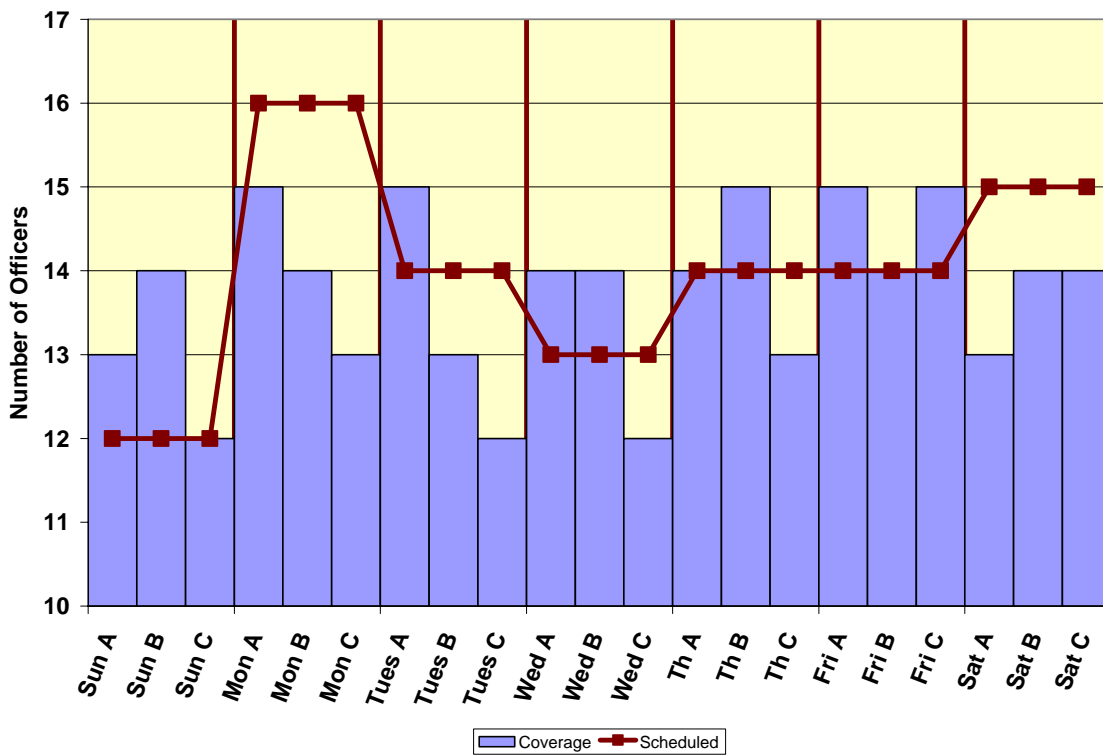


Figure 6 compares coverage and scheduled hours according to one shift for a week.

Figure 6: Week-Long Comparison of Coverage to Schedules, By Shift (A.B.C.)



Is the Schedule Efficient?

Fortunately, the same techniques used to determine sufficiency also indicate efficiency. A negative number in our previous calculations told us that the schedule was insufficient. A positive number (see Figure 4) suggests that the schedule is *inefficient*. The positive figures and totals in Figure 4 numerically suggest the efficiency-- or lack of efficiency. Figures 5 and 6 graphically identify the times that the schedule exceeds coverage needs by showing where the line goes above the coverage needs.

Few jails have enough money to assign staff when they are not really needed. Sure, we can always use more staff at just about any time, but remember there are costs to these windfalls. For every hour that a staff member works above coverage needs, that hour is no longer available to be used to meet coverage needs at regular pay. When an employee's regular hours are used up, you must pay a 50% premium as overtime or compensatory time, and the costs will mount even faster.

Even worse than the potential costs, you might find yourself unable to replace the hours, leaving subsequent shifts short of staff, thereby creating inequities for your staff and increasing the risk to staff and inmates. This is where the numbers in Rows D and E come into play (Figure 4). The example in Figure 4 shows that 6 shifts fall outside of coverage needs (Row D and Row E, 2 below, 4 above). When we consider that the regular-time hours lost when we schedule extra staff (E) create the need for overtime hours, we realize that the sample schedule creates an overall premium of 9 shifts, not 6.⁵

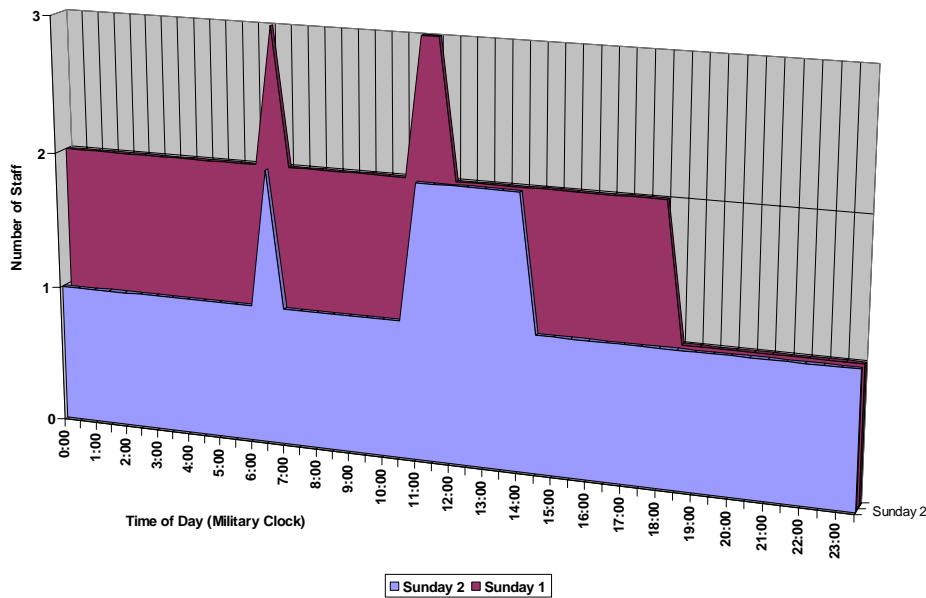
Is the Schedule Consistent?

The mechanics of schedules are often deceiving. What looks simple and straightforward on paper sometimes produces erratic results from week to week during the cycle. We will explain scheduling math and mechanics in our next article. For now, consider a situation we recently encountered in a jail has a two-week schedule cycle. As we charted the actual hours and days worked, we discovered marked differences between staffing levels in the first and second weeks. Figure 7 provides an example of these inconsistencies.

Figure 7 is derived from a spreadsheet that records scheduled staff in 30-minute increments. By placing the first week of the cycle in front of the second week, we highlight the difference-- the inconsistency. It is not unusual to find such variations during the cycle of a schedule. When this occurs, it opens the door for budget officials to ask "If you get by with the lower number of staff during at those times in the second week, why do we need the additional staff in the first week?" But using the technique presented in Form E, you bypass such questions by evaluating the sufficiency and efficiency of each hour of each day against the underlying coverage needs.

⁵ Multiplying 6 by 1.5 yields a total of 9 shifts.

Figure 7: Example of Inconsistent Schedule (Two Week Cycle)
 Scheduled hours for Week 2 are shown in front of Week 1



Is the Schedule Attractive to Staff?

In most jails it is difficult to find and retain qualified jail employees. We must be careful to ensure that our scheduling practices do not contribute to these challenges. Better yet, we should strive to adopt schedules that attract and help to retain staff.

Many jail employees are represented by a union or some sort of bargaining unit. Employee contracts often address specific scheduling criteria or issues. These contracts must be considered as you evaluate and improve schedules.⁶

We must be mindful of the many ways that our approach to scheduling may encourage or discourage prospective and current employees. If that were not difficult enough, we also need to acknowledge that our employees often do not agree among themselves when it comes to scheduling issues and preferences.

Here are some of the factors to consider when evaluating how attractive your schedule might be to your jail employees:

- *Length of work day.* Some employees do not want longer shifts, such as 12-hour shifts.
- *Number of days worked.* Some shift configurations require fewer days of work each week, such as 12-hour shifts.
- *Shift worked-- time of day.*⁷

⁶ The NIC Workbook recommends involving union representatives, along with other stakeholders, on the staffing analysis team.

- *Days off-- consecutive days.* Proponents of 12-hour shift configurations note that staff members actually work fewer days in the year, reducing transport cost and time and parking costs.
- *Days off-- weekend days.* Many schedules produce the same days off for each staff person throughout the year-- great for those who have one or two weekend days off, not so great for those who end up with no weekend days off)
- *Consistency from week to week with regard to days off.* Some schedules end up changing the days worked from week to week, making it more difficult for staff to adapt and to cope with their personal and family needs (but often resulting in a more equitable distribution of weekend days off).
- *Consistency from week to week with regard to work hours.* Some schedules employ a “swing shift” that overlaps two traditional shifts. This is sometimes unpopular with staff.
- *Something to work toward.* In addition to gaining seniority and moving into more desirable posts, employees who gain longevity in some jails are able to choose from a variety of shift configurations, such as a 4/10 (four, 10-hour days).
- *Work conditions.* Staffing levels are key factor when your employees characterize their work conditions. If some shifts provide insufficient staff, the employees who must work on those shifts are less satisfied with their working conditions.
- *Ability to use earned time off.* Some schedules require limits on the number of employees who may schedule time off

These are just *some* of the factors that make a schedule attractive to current and prospective staff. The best way to find out what is important to your staff is to ask them. Better yet, involve them with the evaluation and improvement of your schedule.

Does Your Schedule Promote Staff Health and Performance?

There is ample research to prove that some work schedules are unhealthy for staff, and that some schedules reduce the ability of staff to properly and consistently perform their duties. Some professionals believe that a 12-hour shift in a jail is too taxing for jail employees, causing their performance to fall off in the latter hours. Others are adamant that jail employees are perfectly capable of working effectively for 12 hours. The research is split on this question. Some jails require employees to work longer than 12 hours, often for 16 hours or more, and there is agreement that this is not only unhealthy but also poses higher risks of poor performance.

Health and performance considerations are associated with:

- Working an employee too long at one time
- Providing insufficient time between shifts to rest
- Changing work hours frequently (e.g. rotating staff from days to evenings and nights)
- Posing a higher likelihood that staff will be required to work overtime

⁷ Remember that some staff actually prefer to work afternoons or nights.

When it comes to evaluating health and performance issues, employees should be asked for their opinions, but managers should also be cautious. Some of the longer shift configurations (such as 12-hour shifts) are extremely attractive to employees for personal reasons (e.g. more days off) and sometimes for financial reasons (e.g. more time to work a second job).

We encountered one jail that adopted a 12-hour shift configuration, where staff had the same number of days off as they had on the job. The official who adopted this schedule cited the benefits for employees' families-- having more time at home-- as the primary consideration that prompted him to go to 12-hour shifts. But a survey of jail employees staff revealed that every one of them had used the time off to take a second job, and some even worked full-time in these other jobs. What was a well-intentioned gesture by the official produced a situation in which many employees reported for work tired and stressed.

We expect our employees to voice their self-interests and we should encourage that. That means that it is up to managers to speak for the jail and its operations. Making a schedule healthier for employees, and more likely to improve their performance, may not be popular with them. Managers and officials must balance employee interests with the needs of the jail.

Summary

This article launched our examination of schedules, starting with effective techniques to evaluate current and prospective schedules. We introduced a new tool (Form E) that quantifies and depicts the manner in which a schedule relates to underlying coverage needs. We also identified considerations that are more qualitative in nature. In the next issue we will explore the nuts-and-bolts math and mechanics associated with developing and refining schedules.

The materials identified here, along with many other resources, are available at no cost at our on-line staffing analysis clearinghouse: www.staffinganalysis.com.

The clearinghouse is a service provided by CRS, Incorporated, a non-profit organization (www.correction.org).

Rod Miller has headed CRS Inc. since he founded the non-profit organization in 1972. He is the author and co-author of numerous texts and articles on various aspects of jail planning, design, and operations. For more information, contact him at rod@correction.org, 925 Johnson Drive, Gettysburg, PA 17325, and (717) 338-9100.

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Glossary of Staffing Analysis Terms	
Coverage Plan	The description of the <i>minimum</i> numbers and types of staff needed to operate the facility at each hour of each day in the week.
Shift Configuration	The combination of: <ul style="list-style-type: none"> • Number of hours staff will work on a given shift • Start and end times for each shift • Number of days to be scheduled on and off Many jails have more than one shift configuration.
Schedule	The assignment of individual staff to shifts on specific days, using one or more shift configurations. The schedule assembles all of the shift configurations and matches them to employees.
Cycle	The number of consecutive days needed to reach the point at which the schedule repeats itself.