

ATTACHMENT 1

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Providing Operations, Scheduling, and Safety Consulting to the Transit Industry

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Mrs. Mary Lou Kuschatka
Transportation Director
Chapel Hill Transit
306 North Columbia St.
Chapel Hill, NC 27516

Dear Mary Lou:

I have reviewed your current vacation and absenteeism rates, to help you determine the optimum number of Extra Board drivers. Extra Board drivers are those who do not have a specific assignment (bid run), but serve to replace bid run drivers absent due to vacation, sickness, bereavement, jury duty, and so on.

The attached procedure document, and attached spreadsheet provide additional detail. You may wish to use the spreadsheet in the future, to monitor future staffing requirements.

Establishing the optimum number of Extra Board drivers is not an exact science, but an approximation. The number will vary as absenteeism fluctuates. In Chapel Hill's case, your ability to utilize Part Time drivers to fill open work helps reduce the Full-Time Extra Board requirement – to some extent.

Pertinent information you supplied includes your roster of 77 Full-Time drivers, 21 Part-Time drivers; 77 Full-Time bid runs, and 21 Part-Time bid runs. Further, you indicated that your annual vacation liability is 12,343.37 hours. Added to this, you studied other absenteeism for one quarter. Using that quarter's absenteeism figures, other absenteeism annualizes to 14,477.40 hours.

This total of 12,343.37 vacation, and 14,477.40 other hours, is all attributable to bid runs – thus, you must cover 26,820.77 hours of service per year. As a note, the quarter you studied also included the quarter's vacation time. After subtracting holiday pay of 921.30, your quarter's experience annualizes to 26,742.52 hours – verifying your projection.

We calculated the number of Extra Board operators required to cover this 26,820.77 hours of service in three ways. The most simplistic, which serves only as a benchmark (or sanity test), is to simply divide the 26,820.77 by a full work year of 2,080 hours. In your case, this generates a Full-Time Equivalent Requirement of 12.89, or 14.74%.

Since these Extra Board drivers also earn vacation and experience other absences, we took that into account – generating a conservative and a liberal number. The conservative number is designed to cover bid work only. The liberal number is designed to cover bid work and openings caused by the absence of other Extra Board drivers. In your case, the Conservative Number is 14.53 Full-Time Equivalents (16.60%), while the Liberal Number is 15.12 Full-Time Equivalents (17.28%).

Thus, we can conclude that you need a Full-Time Extra Board of somewhere between 12 and 15 drivers. This number is, of course, moderated by your ability to use Part-Time drivers to fill open work. You should take caution against over-reliance on this, however. In concept, you could fill another 21,840 hours of service with Part-Timers (2080/2, multiplied by the 21 drivers on the roster). However, doing so makes them de-facto Full-Time drivers.

As you do rely on some such coverage by Part-Timers, I would conclude that an Extra Board roster, numbering between 10 and 13 drivers would be reasonable.

The percentages shown above are in the range of industry expectations, for systems with liberal vacation/leave policies and a higher number of senior drivers (who earn additional vacation).

Sincerely,



Arthur N. Gaudet
Principal

Extra Board Sizing Calculation

Here is a summary of how a property may estimate the best size for an Extra Board.

Note well that this is not an exact science, but an approximation. Your potential to use regular drivers at overtime, part-time drivers, etc. may influence the number of drivers required. Drivers' ability to work their vacation, or "sell it back," or even carry it forward until retirement also affects the number. Balance any number generated with your knowledge and experience – and do "sanity tests." For example, the first sanity test is to generate a gross number of drivers needed, as if all Extra Board operators work a full 2,080 hour work year. To do this, take your vacation accrual and sick/other leave experience, and divide it by 2,080. Of course, since Extra Board operators earn vacation, and call in sick, we know that this number will be on the low end. To generate numbers that consider the implications of Extra Board drivers taking vacation and otherwise missing work, follow the steps below.

The conservative approach uses Extra Board operators to cover only bid runs – when an Extra Board operator is absent due to illness, etc. , they are not replaced. This leads to the projected minimum Extra Board Staffing Level.

The liberal approach calculates the total number of hours to be covered, for all reasons, and divides this number by the average work year of the average operator. In this case, sufficient Extra Board operators would be employed to assure that an absent Extra Board operator is covered by another Extra Board operator. This leads to the maximum projected Extra Board Staffing Level.

First, calculate the number of extra board operators needed to cover open work due to vacation. What you are working with is the vacation time which must be covered by another driver. If your work is seasonal, and operators take vacation during times of reduced service, do not count those weeks. For example, in a university town that operates decreased summer service levels, no Extra Board operator is needed for vacation coverage – the service does not operate.

Calculate vacation hours attributable to bid runs, and the amount of coverage provided by each Extra Board Operator. This will generate the conservative need for vacation coverage.

INPUTS – DATA REQUIRED FOR CALCULATION OF VACATION COVERAGE

- A – Number of Full-Time Drivers
- B – Number of Bid Runs
- C – Annual Vacation Liability, in Hours

OUTPUTS FROM THIS DATA

- D - Vacation Liability Attributable to Bid Runs
- E – Average Vacation Hours Taken by Each Full-Time Operator
- F – Average Number of Hours Worked by Each F.T. Operator, after Vacation Allowance
- G – Number of Extra Board Operators Needed to Cover Bid Run Vacations Only

Annual Vacation Liability, in hours (C) , divided by (the ratio of Full-Time Bid Runs (B) over the Full-Time Roster (A)) equals the amount of vacation coverage attributable to bid runs only (D). Under the conservative approach, this is the amount of vacation coverage needed.

Annual Vacation Liability, in hours, (C), Divided by the Number of Full-Time Operators (A) equals the Average Number of Hours of Vacation for each Full-Time Operator (E). Since Extra Board Operators also earn vacation, we must calculate how many vacation hours they're able to cover. Thus, 2080 hours, less the Average Vacation Per Operator (E), yields the average number of hours worked by each driver, after they've taken their vacation (F).

Calculate the Number of Extra Board Operators needed to cover the vacation attributable to bid runs only (D), by dividing this vacation by the average availability (F), to generate the Number of Vacation Relief Drivers (G).

$C/(B/A) = D$ $(C/A) = E$ $2080 - E = F$ $D/F = G$ – The Number of Vacation Relief Drivers

Second, calculate the number of operators needed to cover open work due to illness, personal days, jury duty, bereavement, etc. Make sure you include all open work due to long-term absence of operators who have bid runs. The point of this calculation is to determine how many extra board drivers will be needed to cover runs which are open (daily, weekly, long-term) for any reason other than vacation. It doesn't matter how you are covering the work now (mandatory overtime, supervisors driving), just be sure that all open work which should be covered by Extra Board Operators is included.

INPUTS – DATA REQUIRED FOR CALCULATION OF SICK/OTHER COVERAGE

A – Number of Full-Time Drivers

B – Number of Bid Runs

F – Average Number of Hours Worked by Each F.T. Operator, after Vacation Allowance

H – Annual Sick, WC, Jury, Bereavement, Excused, etc. Liability, in Hours

OUTPUTS FROM THIS DATA

I – Leave Liability Attributable to Bid Runs

J – Average Leave Hours Taken by Each Full-Time Operator

K – Average Number of Hours Worked by Each F.T. Operator, after Vacation and Leave Allowance

L – Number of Extra Board Operators Needed to Cover Bid Run Sick/Other Leave Only

Calculate this normal annual absenteeism experience, annual hours off due to illness, etc. using your historical data. You may wish to sample a recent period, and annualize this number – remember, however, to ensure that the period is long enough to get a valid sample, and that the period doesn't have any significant anomalies (e.g. – major flu outbreak. Remember, too, to include long-term absences for those drivers having bid runs. This normal experience is H.

Now, calculate the portion of that absenteeism attributable to bid runs. To accomplish this, divide annual absence hours (H) by (the ratio of Full-Time Bid Runs (B) over the Full-Time Roster (A)). The result is (I), absenteeism attributable to bid runs only.

Next, calculate the coverage available from the Extra Board, after allowance for Extra Board Operator absenteeism. To do this, take the absenteeism (H), and divide it by the number of Full-Time drivers (A). This yields J, the average time missed, per driver, due to absenteeism. Subtract J from the average number of hours worked, after vacation (F), to yield the average number of hours worked per operator, per year, after both vacation and sick/other leave time (K).

Generate the number of Sick/Other Leave Extra Board Operators Required – divide I, Bid Run Absenteeism, by K, Hours of Coverage Available per Extra Board Operator. This Number, L, is the additional Driver Requirement due solely to sick/other leave.

$H/(B/A) = I$ $(H/A) = J$ $F - J = K$ $I/K = L$ – The Number of Sick/Other Relief Drivers

Third, calculate the number of operators needed to cover open work that is not built into runs – that must be covered by Extra Board. The calculations above assume that all work is scheduled, and cut into runs. If you have open trippers that work off the extra board, you may need to add extra board drivers to cover them. Include the normal quantity of AM and PM trippers. If you operate charters on a regular basis, add sufficient drivers for Charter coverage. If your Part-Timers have regular scheduled work, you may need to add extra board drivers to cover for their absences, calculated in the manner above. If, on the other hand, your Part-Timers don't have regular runs but cover open work, this may reduce your extra board needs. Remember, you must think of how work will be covered. An AM and PM open tripper pair can be covered by one Extra Board driver.

AM Open and Standby Assignments (M), plus PM Open and Standby Assignments (O), divided by 2, plus Charter Drivers (O), yields Extra Board Drivers needed for open work (P).

$((M+O)/2)+O = P$, The Number of Drivers Needed for Open Work.

The Conservative approach totals Vacation Drivers, Sick/Other Relief Drivers, and Open Work Drivers – $G+L+P$ – to generate Q, The total Extra Board Requirement. This is the low-end number, that says Extra Board Drivers will protect only bid runs.

$G+L+P = Q$, Conservative Total Of Extra Board Drivers – Low Estimate

The Liberal Approach adds all vacation to be covered, all sick/leave to be covered, and all open work to be covered, to generate the high-end number; that says the property wants sufficient protection to cover both Bid Run and Extra Board Vacations/Absenteeism. This number is generated by adding Vacation Liability (C) to Sick/Other Liability (H), to come up to the annual sum of hours missed (R). Dividing that total by the Average Annual Hours Worked by Extra Board Operators (K) then adding the Open Work Drivers (P).

$C+H=R$ $(R/K)+P = S$, Liberal Total of Extra Board Drivers – High Estimate

Overall, the average size of the extra board seems to run between 10 and 15 percent. On a property with low vacation accruals and low paid leave allowances, I'd expect to see a smaller extra board. On an older property, with high vacation accrual (and, potentially, with operators using sick leave and other paid days off), I'd expect to see a larger extra board.

A note about calculating the vacation days to be covered. Some properties allow drivers to work on part of their vacation. If that is the case, do not include the weeks those drivers work in your calculations. Remember that the extra board is covering for actual, not paper absences.

A further consideration which will test the size of the extra board is looking at the guarantee/overtime payment to Extra Board operators. If the extra board is the right size, you will seldom (or never) pay guarantee; but you will probably pay some overtime. Remember that overtime is almost always preferable to guarantee for several reasons. First, overtime only costs you the half-time penalty, since the bus will be driven anyway, at either straight time or time and one-half. Guarantee, on the other hand, costs you a full-time penalty, since you're paying one driver straight-time to drive a bus, while paying the guaranteed operator straight-time. Beyond that, the larger workforce that results in guarantee payments also increases fringe benefit costs.

This leads to a quick test to see if the extra board is now right-sized. Plot extra board hours for a few normal pay periods. If you pay more than 10-20 hours of guarantee, you may have too many operators. If you pay more than 20-30 hours of overtime, you may have too few.

Finally, you may want to take a fresh look at how you cover open work. If you have open trippers, it may be more efficient to let full-time regular operators work them as holddowns, at overtime. An early straight driver can work a PM tripper. A late straight driver can work an AM tripper. The overtime may result in a lower cost than would adding an extra board driver, paying his/her fringe benefits and, possibly, guarantee cost.

Chapel Hill Transit
Calculation of Full Time Extra Board Requirements

Prepared March 12, 2003

DATA INPUTS:		
Number of Full-Time Operators	Input	77
Number of Part-Time Operators (Total Drivers, Counted at Half-Time for A)	Input	21
A - Number of Full-Time Equivalent Operators		87.5
Number of Full-Time Bid Runs (Counted at 40 Hours/Week)	Input	77
Number of Part-Time Bid Runs (Counted at 20 Hours/Week for B)	Input	21
B - Number of Full-Time Equivalent Bid Runs		87.5
C - Annual Vacation Liability	Input	12343.37
H - Other Absences (See Detail Below)	Input	See Below
M - AM Open Pieces to be worked from the Extra Board - 5 days/week (Trippers, Stbys)	Input	0
N - PM Open Pieces to be worked from the Extra Board - 5 days/week (Trippers, Stbys)	Input	0
O - Charters to be worked from the Extra Board - 1 Driver per regular 40-hour week	Input	0

COVERAGE FOR ACCRUED VACATION	ANNUAL	VACATION BOARD DRIVERS NEEDED
C - Annual Vacation Liability (Hours)	12343.37	
D - Amount Attributed To Bid Runs C/(B/A)	12343.37	
E - Average Vacation Time (Hours) Per Full-Time Equivalent Operator (C/A)	141.07	
F - Average Number of Hours Worked, Per Operator - Less Vacation Time Only (2080-E)	1938.93	
G - Number of Extra Board Operators Needed For Vacation Relief - Bid Runs Only (D/F)		6.37

COVERAGE FOR OTHER ABSENCES	Quarterly	ANNUAL	EXTRA BOARD DRIVERS NEEDED FOR SICK & OTHER
Sick Leave (Hours)	2185.09	8740.36	
Excused, Not Paid (But Run Coverage Required (Hours)	1131.79	4527.16	
Workers Comp	93.80	375.20	
Bereavement	152.77	611.08	
Civil	55.90	223.60	
H - Total Hours Not Worked - For Reasons Other Than Vacation		14477.40	
I - Amount Attributed To Bid Runs H/(B/A)		14477.40	
J - Average Other Time Missed - (Hours) Per Full-Time Equivalent Operator (H/A)		165.46	
K - Average Number of Hours Worked, Per Operator - Less Vacation & Other Time		1773.48	
L - Number of Extra Board Operators Needed for "Other" Coverage (F/H)			8.16

COVERAGE FOR OTHER OPEN WORK - TRIPPERS, ETC.		OPEN WORK DRIVERS NEEDED
M - AM Open Pieces to be worked from the Extra Board - 5 days/week (Trippers, Stbys)	0	
N - PM Open Pieces to be worked from the Extra Board - 5 days/week (Trippers, Stbys)	0	
O - Charters to be worked from the Extra Board - 1 Driver per regular 40-hour week	0	
P - Extra Board Drivers Needed for Open Work		0.00

TOTAL SYSTEM REQUIREMENTS - CONSERVATIVE AND LIBERAL CALCULATIONS

CONSERVATIVE CALCULATION:

Q - Total Extra Board Operators Needed - Conservative Calculation (G+L+P)
 Low End - Protects Only Bid & Open Runs

**EXTRA
BOARD
DRIVERS
NEEDED - FTE**

Note - Coverage is calculated separately to generate the conservative estimate, reflecting the position that, when an Extra Board operator is absent due to vacation/other, his/her Extra Board position is not filled.

	DRIVERS -----	14.53
	PERCENTAGE -----	16.60%

LIBERAL CALCULATION

C - Annual Vacation Liability (Hours) 12343.37
 H - Total Hours Not Worked - For Reasons Other Than Vacation 14477.40
 R - Total Coverage Hours Required 26820.77
 K - Average Number of Hours Actually Worked, Per Operator, Per Year 1773.48
 S - Total Extra Board Operators Needed For All Coverages - Liberal Calculation (R/K)+P

	DRIVERS -----	15.12
	PERCENTAGE -----	17.28%

**EXTRA
BOARD
DRIVERS
NEEDED - FTE**

Note - Liberal Calculation reflects hiring a sufficient number of drivers to replace Extra Board drivers who are absent - maintaining a full roster of availability.

Raw Number Test - Projects FTE Extra Board Needed to Cover

If All Extra Board Operators Worked 2080 Hours/Year (52 Weeks @ 40 Hours) R/2080

	DRIVERS -----	12.89
	PERCENTAGE -----	14.74%