

WINTER MAINTENANCE SHIFT SCHEDULE AND LABOR MANAGEMENT

Mohamed M. Alkoka, P.Eng.
Operations Engineer
City of Ottawa
735 Industrial Ave, Ottawa, Ontario, Canada
TEL: +1(613) 580-2424 ext. 21177
E-mail: Mohamed.Alkoka@City.Ottawa.on.ca

William S. Beveridge, P.Eng.
Former Director of Infrastructure Maintenance Division
Region of Ottawa-Carleton
735 Industrial Ave, Ottawa, Ontario, Canada

1. ABSTRACT

The evolution of winter maintenance has not been limited to equipment and materials. Shift schedule management can play a significant role in the economics of an operation.

Standard practice for winter maintenance operations was to schedule three (3), eight (8) hour shifts per twenty-four (24) hour period to cover any snow and ice emergencies. This practice was subjected to extensive criticism for the periods between storm events.

The first change reduced three (3) shifts to two (2) balanced shifts per twenty-four (24) hour period with the two four-hour remaining periods covered by placing staff on-call with a guaranteed minimum time charge and additional overtime premiums, when applicable. Such arrangement eventually lead to the criticisms of overtime payment and the cost of supporting full crews on standby. The standby and on call conditions were that being placed on call caused a minimum three (3) hour payment and where an actual call out occurred, that minimum was paid on top of an overtime premium for all hours worked.

The current arrangement of shift hours, and time management is well suited for a specialized operation such as winter maintenance. Added to that the effect of several other factors that will be discussed in details in the full-length paper.

The objective of this paper is to document the experience of the Region of Ottawa-Carleton in achieving maximum benefits of shift labor management while working with in the collective agreement.

2. INTRODUCTION

Road maintenance operations is quite involved, with a mix of equipment, material and labor in a delectate balance to achieve the objectives of a road maintenance operational mandate. Such a balance is even more critical when dealing with weather related maintenance, especially winter maintenance. When dealing with winter maintenance operations, weather is the controlling factor that dictates the response and the extent of the effort to be utilized.

Road Authorities mandated with road maintenance will establish elaborate, and complex systems to insure that the proper equipment, along with labor required to operate that equipment are available at right time when needed.

3. CURRENT PRACTICES

To insure the availability of road maintenance staff at time of snow storms and inclement weather that would require the clearance of snow and ice from the road, manager and supervisors have been scheduling shifts around the clock, 24 hours a day. Typically that would be in three shifts, eight hours each and a full crew that will cover each shift. In many cases that meant that each piece of equipment had three operators, a shift supervisor, a shift mechanic, and so on. Not to mention all the human resources required keeping track of all work assignment and personal related issues.

Some road maintenance authorities went to the extent of creating the so-called ‘winter camps’ and made it a requirement on contractors working for them to comply with such requirements. A winter camp is similar to an army barracks camp or a fire department crew arrangement; it consists of an equipment depot along side living and sleeping quarters for equipment operators, on a rotating schedule. Staff will be living within the compound 24 hours a day, ready to move on a moment’s notice and start combating snow covered roads. With such arrangement, no one person is allowed to leave while on duty for more than a certain time, while rotating shifts schedules insured that staff are properly assigned.

Other practices to insure a reasonable response time were to establish time limits of when the operator, or contactor would report after notification of a pending maintenance activity or an approaching storm. For example an operator, or a contactor under a maintenance contract, has to be at the start of the pre-assigned maintenance route with one hour of a call-in. In case of municipal staff for instance, the supervisor on duty will make the call, if a response was not confirmed, the next person on the list will be called to duty. The list is will be largely developed based on wither contractual, and hiring agreements, or collective bargaining agreements. A list may be prepared based on a variety of criteria, such employment seniority, availability and distance from work location. Such methodology would also include remedial action for non-compliance, such as loss of propriety on the call-in list if an operator does not respond a certain number of times, to payment penalty as per contact clauses covering the issue.

4. SHIFT TIME SCHEDULE

Shift time management can play a considerable role in shaping a roadway winter maintenance operation. Many styles and arrangement have been used by various agencies, some of which have been mentioned above. The question to be answered by all, is: How to be ready at all times to perform roadway winter maintenance and maintain roads open to the public, emergency services and law enforcement, while maintaining an efficient and cost effective operation. One scheme to insure availability of operators was simply to have three work shifts, eight hours each during the winter months for full twenty-four hour coverage. Staff in each shift will be waiting at their posts for the order to move upon identification of oncoming of a snowstorm and winter emergencies.

Under the prevailing of reduced budgets, a shift had to be eliminated to relive some of the financial pressures. The numbers of scheduled shifts were reduced form three shifts to two shifts. One shift, the day shift, started at 7:00 a.m. and ended at 3:00 p.m., while the evening shift started at 7:00 p.m. and ended at 3:00 a.m. The time zone between the two shifts was staffed by a patrol supervisor, who is in effect the shift leader, and by staff on-call, with on-call pay. And during

persistent winter storms events, extending the day, or night shift into over-time with over-time pay covered the in-between time zone.

However, there were drawbacks to this arrangement, traffic patterns have not been considered properly in this time sequence. The pattern of traffic peaks in urban areas, or rush hours, are mainly between 7:00 and 9:00 a.m. in the morning and the afternoon one is between 3:00 and 5:00 p.m.

Under this particular shift arrangement the first shift had just started, so did the morning rush hour. Therefore, the maintenance operation is caught in traffic and has to work with increased traffic volume and tie-ups, and properly traffic accidents. It should be noted that icy roads might have caused some of these accidents for the early morning hours.

Similarly, the second shift started at the same time as the second rush hours starts with the similar issues as the first shift faced in terms of traffic delays. In between the official shift times these was the chance to extend either shift to cover the dead time zone, which meant an added load on budgets to pay for overtime premiums.

5. ON-CALL (STANDBY) ASSIGNMENTS

On-call, or standby, payment systems were designed to compensate the employee for disrupting his livelihood to be available for work within a prescribed period of time. The stand-by and on-call procedures were that if an operator was placed on-call, he would then be paid a minimum of three hours, weather he had been called on not. And upon his call-in, he is then paid the minimum plus any other time worked at the incremented over-time pay rate.

Due to collective bargaining agreements and local laws regarding unionized labor an on-call system has to comply with cretin rules, such as the priority call-in, and seniority status. Seniority, the length of employment of a worker, will dictate who is called first to fill in an on-call assignment, as will it dictates who is called first to work when operators are called to mobilize outside their regular shift hours.

6. THE ULTIMATE ARRANGEMENT

By careful observation and analysis of traffic patterns in the Ottawa area, and in any metropolitan are for that matter, it can be found that the peaks are mainly between 7:00 and 9:00 a.m. in the morning and the afternoon one is between 3:00 and 5:00 p.m. Added to the observation is the pattern of non-peak hour travel, it can be found that the vehicular travel between the hours of 3:00 p.m. and 11:00 p.m. is discretionary for the most part. Whether it is to go to a ball game, the movies or a restaurant meal in the evening. Such travel can be postponed and re-scheduled by most people if the weather conditions are adverse, or if a road conditions advisory has been announced.

Following the analysis and the traffic patterns as well as consideration of the need to minimize on-call and standby time, an adjustment to the shift schedule were introduces. There are two shifts, a "Day Shift" that starts at 7:00 a.m. and ends at 3:00 p.m., and a "Night Shift" that starts at 11:00 p.m. to 7:00 a.m.

The newly adopted shift schedule can achieve significant advances in roadway winter maintenance operations. With such schedule arrangement, the night shift will be work on combating the adverse weather condition and clear the road network from snow and ice during their duty time and be active overnight. By the time they are winding down their operation the streets are ready to receive the morning traffic. Should the storm presets, the day shift will come

to the rescue with fresh energy to continue the work with ease, as their job will be to maintain the roads open rather than open them after snow and ice had settled in and hardened on top of the pavement surface.

Should the storm form during the daytime, or another storm is persistent from the day before in to the daytime, the day shift would have been working at it before the afternoon traffic rushed into the street. And as well as their counter parts at the night shift they will have the roads ready for the afternoon rush hour traffic.

Now remains the issue of the eight-hour time period with no staff available. Well should the need arises during the day for the presence of winter maintenance staff, the patrol and shift supervisor will request that the day shift staff are to stay for four (4) more hours, and be compensated based on the overtime premium system in place at the time. Similarly, if the need continues beyond twelve hours for the day shift, or an early start is required for a pending night storm, then the night shift will be called-in early and be paid in accordance with the on-call system pay scale.

The day and night shift schedule will help minimize the need to place staff on-call since staff on the night shift are no more than four hours away from their regular shift. While the day shift is always there when the need for them arises.

One other advantage of having the shifts at the times described above is the direct contact between staff at each of the shifts as there will be a hand out at 7:00 am when the night shift has completed their time and the day shift is just starting. Such hand-over between staff will ensure that no abnormalities goes unnoticed and allows for the supervisors of each of the shifts to verbally brief his counter part during the hand-over procedure. The on-call supervisor will handle the hand-over at the start of the night shift on a quite night, or by the day shift staff themselves on a snowy busy night.

7. SUMMARY AND CONCLUSION

Winter maintenance operation is quite complicated and involves a variety of activities and should be considered as a system. Shift time schedules are an integral part of the system, and can have a positive impact on the operation when properly assigned and implemented.

The application and use of new technologies will assist in having a successful shift schedule, weather condition and road condition forecasting, road weather information systems, commutation tools, such as cell phones, digital 2-way radio, pagers, and techniques such as pre-wetting and anti-icing will all contribute to the model of in-time maintenance delivery system.

This paper summarized the experiences of the Former Regional Municipality of Ottawa-Carleton in using shift time schedule in maintaining the same level of serviceability and reducing the cost of these operations. This process is based on optimizing the working hours for the staff, where more suitable working hours were selected to be more convenient from the staff point of view as well as to match the expectation of the road user with the minimum cost.