

## RISK MANAGEMENT

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Risk Management means different things to different people and industries. In the insurance industry it means that if a client pays a certain fee, the company assumes the risk for his errors. The insurance management concept applies to the determination of the amount of the fee required to offset the probabilities that a claim will be filed in the first instance, and for specific incremental dollar amounts of a possible claim in the second instance.

Risk is something we quickly analyze in our human computer each time we make a decision. Many times we even compute the dollar value of decisions. Imagine it has been snowing hard all night, and when your radio alarm awakens you with, "This station suggests you stay home unless you absolutely have to travel today, the highways and streets are hazardous", immediately you become concerned and the computer in your head starts to analyze the situation. What are the chances that I can get to work at a reasonable time, if at all? If the roads are really icy, what is the risk I could be involved in an accident? Could I get stranded somewhere and freeze? If I get to work, will anyone else be there, or will my boss say it is so bad that I should go on home? Is it worth a day's pay to avoid these risks and stay home? If I get hurt, I could miss a lot of work, or if my car is out of action for repairs, how will I get to work? Maybe I can take the bus or train! If I get to the bus stop, will it come? If it does, will I get home? If I get to the train station, will the train be there in time to get me to work? Can I get home later on in the day? Do I have the money for the train? After all consideration, the decision is derived by, "What will it cost me if I stay home? What will it cost me if I go to work? As a maintenance manager, you make many decisions which affect a diverse group of people. Each time a decision is reached a different combination of facts are used for analytical purposes which impact people in different ways. You affect the motorist, the resident adjacent to the highway, community groups, manufacturers, contractors, vendors, employees, and work groups.

As a highway maintenance manager, you make many decisions each day, and unless you evaluate the risk of the decision you may produce an unforgiving situation because of the impact of your decision. This paper will discuss RISK MANAGEMENT as it applies to a maintenance manager.

Whenever a decision is made about any maintenance work item, it impacts either the public or your agency. If you receive a complaint about mowing a section of roadside, you will either mow it or tell the complainant that there is a reason why you cannot perform this service. In the first instance, the impact to your agency is money spent on a project, and if it was not already on your schedule, it will cause some other project to be deferred. A no answer to the complainant may cause a problem in the form of a habitat for undesirable animals or pollen irritants to property owners, in addition to an irritated complainants' ego with further public relations problems.

Decisions are made at many different levels in an organization which may impact a very small segment of the population, or millions of motorists. Who decides which pothole to patch, the maintenance worker? Who decides which section of roadway is to be patched? Who decides on how patching material and equipment will be distributed? Who decides the quantity of patching material to be purchased for a year? Who decides how much funding will be given for maintenance activities?

A pothole could cause problems to several thousand motorists in a day such as, misaligned front end alignment in the car, a tire blowout or other failure, a swerving accident, a general slowdown in speed causing lost time, excess fuel consumption and noise transmitted from the bump to adjacent houses. If there is a series of potholes, the accident potential increases as does the potential for vehicle damage, slow speeds and noise transmission. In addition, the vehicles may be using significantly more fuel causing a local pollution problem. What is the environmental harm to humans, wildlife, and vegetation? If groups of potholes are not patched promptly, the deferred maintenance can cause considerable future

rehabilitation costs. In the event potholes become rampant throughout the jurisdiction of a public agency, what can the total cost of rehabilitation be, due to accelerated decay?

Other examples of decision impacts are:

1. Mowing sight areas - cost vs. potential accidents.
2. Signs that are missing or illegible - shall they be replaced in 24 hours, 1 week, 1 month, as they relate to the type of sign and the cost to the agency or potential accidents.
3. A fence is cut and it is possible that entrance could be gained to the highway. What is the cost of repair, potential for accident or withdrawal of federal funds?
4. Snow removal and ice control is an operation that is required over a large geographic area at the same time. If one area is left unattended while crews are working in another, what is the potential for accidents, extra fuel consumed, additional pollution, extra travel time, expense of lost available work hours, potential for a closed road for a period of time, additional cost for removal or added expense of winter materials? On a wider basis, is the equipment and materials stored at the most economical or most responsive location, and what is that effect on response time, which directly impacts all of the above? Do you have a residence requirement to have a determined response time which will cause an impact on the agency and the public?

A manager of maintenance activities always has to deal with budgetary allotments that affect manpower equipment and materials. The management of these resources can be handled in many different ways. In general, most maintenance organizations have a defined schedule of certain work activities. Some of these activities are resurfacing, guide rail replacement, surface seal coating, crack sealing, mowing and line striping. While certain areas of maintenance work can be effectively scheduled far in advance, other activities cannot be scheduled in that manner and the work program therefore must be flexible to accept certain work activities that can only be scheduled on a short-term basis. Examples of some of these short-term activities are: snow removal, pothole patching, sign replacement due to knockdown, repair pavement blowups, and relief of flooding.

A budget is provided that allows for a mix of the three basic resources and a manager has to decide what type of mix he will utilize. When the manager makes this decision, he is setting priorities on the work that will be accomplished on the highway system. In addition to setting priorities through the budgetary allocation process, there are other ways that priorities are set for the maintenance activities, particularly through many of the outside restraints such as legislative activities, political pressures, complaints, court settlements and the supervisor's directive. A manager may also have his personal preference on what type of work is most important to his agency. My personal preference is to patch main pavement and maintain the drainage, while someone else's personal preference may be to maintain the safety of the motorist through striping, sign replacement, sight distance clearing, and warning devices.

Another way work is planned that reflects in the total program is related to the availability of a particular resource. If patching materials

are not available, you cannot patch potholes. If manpower is not available, you cannot patch potholes. If equipment is not available, you cannot patch potholes. A combination of resources must be available to perform pothole patching, while another activity may only use either one or two of the available resources. When one of the required resources (manpower, materials or equipment) for any assigned work activity is not available, alternate solutions must be implemented through schedule changes. This rescheduling is a quick reactionary planning technique that changes the work program.

It is important that the impact of all our decisions are married with the management of resources and work programs. A total program would include the evaluation of the assignment of the resources and the impact of decisions that are made. Many of the decisions that are made, either in resource assignment or in the establishment of a work activity, will have a great impact on someone. This impact may turn around to be a tort liability suit against the manager and his agency, which can either be based on the fact that the agency knew about a dangerous condition and did not correct it, or that the condition lasted sufficiently long that they should have known about it and therefore performed corrective work activities. When the program is established, it is very important that the manager weigh the impact of his decision to see what the total affect will be.

Risk Management in the maintenance area could be defined as "the management of a work program that is implemented after all possible impacts are analyzed in an effort to minimize the aggregate expenditure of funds." This expenditure should be all impacts reduced to their dollar value as they affect the agency, a citizen or a motorist. Many definitions of Risk Management include the fatality of the motorist, but eventually that works out to a dollar value which can be incorporated into a Risk Management Program. In developing a Risk Management Program, it is very important to determine the objectives, identify the risks that you are willing to accept, and evaluate the alternatives to accepting the risk, either through the elimination or transfer of the risk to another source.

An example of this risk transfer was recently the object of a court decision where a large amount of money was awarded to an accident victim in Newtown, Pennsylvania. The scene appeared to be a typical winter maintenance operation, with slippery pavements. The town was notified that there were icing conditions and accidents were occurring. The road in question was under the jurisdiction of the state, not the municipality, but the court ruled that the municipality should have reacted since they were notified and they were immediately available as it was within the limits of the municipality's borders. This oversimplifies the situation, but apparently the state effectively transferred the risk to the town. There may be other ways of transferring risk back to the motorist, such as in New York State where certain roads are reported closed on designated radio stations during periods of heavy snowfall, even though they could be passable.

An example of Risk Management Program is one that occurred in New Jersey, relating to service to the public during the winter maintenance season. A thorough analysis was made of the need for winter material storage facilities. This analysis included the use of several year's data relating

to the amount of snowfall, the usage of chemicals on each section of roadway by a given foreman, and the amount of storage facilities available at a specific geographic location. Each storage facility was analyzed to see what its capacity was, as related to the expected need for that assigned area. Knowing the limits of the assigned foreman's section, it was then determined how effectively materials could be stored for use within that section. After analyzing each location, a map was drawn, similar to a contour map, for the whole state. Utilizing this information, the high areas of need and the areas already adequately supplied were identified. The map was then colored in three colors, one indicated all of those facilities and geographic areas that could be covered with an adequate supply of materials. Another represented those considered to be marginally acceptable since they would meet the minimum requirement for less than the average winter. The third area was considered completely inadequate for storage facilities. It was quickly determined that there were several geographic areas that needed immediate attention. One area was in the most densely traveled section of the state, known as Philadelphia-New York Corridor. The area was roughly 55 miles long and 20 miles wide. In the center of this geographic area, there was an intersection of three major state highways and one interstate highway. Calculations indicated that if one large storage facility were built at this intersection, it would provide the necessary materials to change the character of this entire geographical area from inadequate to adequate. Several sites were considered and were ruled out because of their location. Property not owned by the state was not considered as a possible site due to insufficiency of funds and to the time requirements involved. An abandoned maintenance facility, about one mile from the intersection of these major routes, was identified as the best location, and since it had been a maintenance site for more than 20 years, it was selected as the best site from management perspective. Past history had indicated that residents in the area were not favorable to having a maintenance facility at that location; however, it was indicated that the increase in transportation time and response time from any other location would be an unacceptable risk to the motorist and the incurred expense to the Department for transportation of materials would be too great. Although numbers could be applied, they will not be included in this presentation. After the risks to the motorist and the Department were evaluated and considered, it was then reviewed from the perspective of the land owners in the township where the building was to be constructed. Major public opinion would be against the Department in this venture and it was decided to assume the risk of any opposition from either the local citizens or the municipality itself. In reality, the municipality went to court and obtained an injunction against the construction of the facility. Court action occurred and an eventual decision was rendered that the state had wisely proceeded and protected the general public to the best of its ability. Although the court costs and the legal fees were high, the risk involved was the minimum condition. If the court had ruled against the specific location, it would have cost more to purchase land and build at a nearby site. That was the risk that was assumed in making this Risk Management decision.

The maintenance manager should be aware of the Risk Management technique, and review each decision in light of the various tradeoffs, at either a very local level in activities such as expensive traffic control through work zones vs. a decrease in productivity, or tort liability suits, the scheduling system of maintenance work by managers or through the allotment of resources by upper echelon management. The impacts of all affected groups and the environment should be considered. The ultimate decision should be that one with the lowest risk of money and lives, through the use of a management system, that utilizes all available information that would stand up against any hostile adversary.