

# City of Spokane

December 2002



# City of Spokane – Ergonomics Demonstration Project

## Introduction



The City of Spokane has more than 2,100 full-time employees. When summer and seasonal staff are considered that number can rise to some 3,000 workers. These employees are spread out over 12 main divisional areas, which can be further broken out into 27 departments and once again

broken out into even more functional work areas. Within the divisions there are a wide variety of job classifications, such as firefighters, police officers, gardeners, street maintenance workers, utility workers, solid waste workers, parking meter collectors, and office staff. When the Washington State ergonomics rule came out in May 2000, the City's Risk Management Department realized that it would take both time and careful planning to apply the rule to the large number of staff that they have doing such a wide variety of job functions. The city might also need plenty of time to budget for any changes that might be necessary if Work-related Musculoskeletal Disorder (WMSD) hazards were found.

## “Delegating” the work

Although the City has until July 1, 2004 to meet all of the requirements of the ergonomics rule, they began work early in 2001. To help distribute the work of finding WMSD hazards and applying ergonomic changes, they asked each of the departments to volunteer an “ergonomics delegate” to be trained for this purpose. In all, 43 delegates were recruited, and most have received three to four of the following training classes:

1. **The basics of ergonomics** – What the science of ergonomics encompasses, the requirements of the ergonomics rule, the City's plan for complying with the rule, and how the delegates will be involved.
2. **Train-the-trainer** – How to explain ergonomics to employees in their department, how to evaluate jobs using the caution zone and hazard zone checklists, how to provide ergonomics awareness education to employees and supervisors, and tips on running a successful meeting.
3. **Office ergonomics** – How to solve problems and apply ergonomics in the office environment. (Many of the delegates wanted to have some basic ideas on ergonomic solutions before they provided employees with awareness education, so that they could better handle any questions that came up during the presentations.)
4. **Industrial ergonomics** – How to solve problems and apply ergonomics in heavy or manual labor types of jobs. (If a department had only office staff, their delegate did not need to attend this training.)

While much of the training focused on rule compliance, the City did decide to adopt a “best practices” perspective, and trained delegates to spot musculoskeletal hazards that exceed the scope of the Washington State Rule. This allows the delegates to do a more thorough evaluation and address all issues that may be a concern for causing injury.

## Providing resources

A key resource provided to the City of Spokane delegates is The Ergonomics Binder. The binder contains all of the information needed for the departments to implement the ergonomics program, including:

- Training materials from all of the required classes.
- Ergonomics analysis and recommendations from a variety of free sources such as research universities and Labor & Industries publications.
- Catalogs for ergonomic office accessories and furniture, and industrial tool and materials handling equipment.
- Copies of checklists, and forms to help delegates track who has been trained, when the caution zone checklist had been turned in, when the job has been evaluated, the findings, and what changes were made to the job as a result.
- Purchasing guidelines, and a cost-benefit analysis worksheet in case equipment purchases were necessary.



The binder was submitted as a training example and won the Best Product award from the Public Risk and Insurance Management Association (PRIMA) in 2002.

To accomplish the evaluations the City provided an ergonomic tool kit that can be checked out by delegates so that they can scientifically evaluate the jobs. Tools for implementation are not required under the ergonomics rule, but the City focused on making the ergonomic evaluations as scientific and valid as possible. Armed with credible information, the evaluations can be used for both Civil Service Job Analysis, as well as providing concrete documentation for the ergonomic assessment after employees have been given the opportunity to provide input on the L&I Hazard Zone Checklist.



The kit includes a scale, a push-pull spring gauge, grip force measurement tools, a postural angle measurement tool, a light meter, time and frequency measurement tools, a digital camera, and some examples of simple solutions to help illustrate ergonomic principals. The tools have replaced the “educated guess” and in some cases have revealed WMSD hazards that were not previously perceived.

## Awareness Education and Caution Zone Jobs

Once trained, the ergonomics delegates took the materials back to their departments and presented the awareness education to their staff. At first, they used a slide show and handouts that had been customized with some City of Spokane examples and information on the additional risk factors not covered by the rule. Once a video of the awareness education became available from L&I, many of the departments chose this method for providing the education due to its ease of use.

The city decided to give the education to all of their employees, not just to those who work in or supervise caution zone jobs as is required by the rule. This was decided for three reasons. First, 35% of the City's injuries were estimated to be WMSD related, and these same injuries comprised 53% of the total cost of all injuries. So there is both a moral and an economic incentive for making things better. Second, the philosophy of assuming the job is a hazard until it is proven not to be a hazard eliminates the chances that important jobs would be skipped over in the evaluation process. Third, the City felt that having everyone aware of ergonomics would facilitate increased awareness and injury reduction. According to their Risk Management Department: "If we are going to spend the time and money to do the program, we wanted to see that that we were doing the best loss prevention that we could the first time around."



To take advantage of the portability of the ergonomics awareness education, all of the staff who have received training were entered into a training database, and then cards were printed from the database and given to each individual. These cards are similar to cards that staff are given if they have had first aid, forklift, or respirator training. This helps with the portability of the training internally as well, since employees moving from one department to another don't need to be retrained. After

receiving the awareness education, staff were able to fill out the caution zone checklists themselves to give the delegates an indication of which jobs they would need to assess further. This allowed them to further distribute the task of determining which jobs were caution zone jobs, so that no one staff member would be overloaded. Everyone had a chance for input.

One of the more important concepts in the training was the notion of "Continuous Process Improvement." Their Risk Management Department states: "We were very clear with employees that an ergonomics program didn't mean instant sunny skies, blue birds and roses. It is a process of identifying hazards and working together to make the job less hazardous and more productive – it may take years before yielding measurable results. Furthermore, the work of identifying and correcting hazards is something that needs to be a recurring goal."

## Increase in injury reporting?

Risk management was at first concerned that providing the awareness education and having employees fill out caution zone checklists would result in an increase in claims. It was feared that employees might begin to associate symptoms they had been having with tasks they've been doing at work. Despite their concerns, they did not see an increase in claims. One year into the program the number of incidents and claims have declined by 10%, year to date. Risk Management did find that employees were getting more involved, and bringing forward concerns that otherwise may have gone unaddressed. They also observed that employees who had received the Awareness Education slide show were more likely to get involved than those who had seen the video. This is probably due to the increased interaction on the part of the Ergonomic Delegate when they have to present the information themselves.

<b>Year To Date Comparison Workers' Compensation Claims</b>			
<b>Period</b>	<b>1/1/01 to 11/7/01</b>	<b>1/1/02 to 11/7/02</b>	<b>Claims Reduction</b>
Incidents & Claims	429	384	10%
Claims Only	302	283	6%

## Analyzing for hazards and identifying solutions

Once the delegates received the completed caution zone checklists they were able to begin working with the employees to analyze the jobs for hazards.

Employees were told about the process – every employee is given the opportunity for input on the L&I Hazard Zone checklist, but this information would be condensed and that the Delegates would only analyze the job, not each individual. The exception to this was that employees could always ask for individual assessment if they are feeling specifically at risk for injury. The employees were also given several escalating alternatives to ask for specific help depending on their perception of need.



The Certified Ergonomic Compliance Director (CECD) working in Risk Management offered Delegates initial help when analyzing the first few jobs, but after some practice the Delegates have been doing analysis and improvements on their own. After analyzing a job, the delegates place it into one of three categories – the hazard zone, the caution zone, or the “no zone,” which means that it does not meet caution zone criteria and is therefore not covered by the rule. With the prioritization they were then able to start to work on the worst problems first.

The City expected to find many hazards going into the analysis phase, especially in jobs that required heavy work or lifting. However, one of the pleasant surprises was that many of the departments had already developed solutions to hazards on their own. They

were then able to champion these solutions as examples, letting staff know that they were already “doing ergonomics,” they just weren’t calling it that.

One of the unexpected challenges was increasing the awareness that ergonomics was not just dealing with office and computer use. There were a few managers who had difficulty envisioning that their laborers needed to be concerned with “ergonomics”, but this lack of understanding was overcome as WISHA deadlines got closer, and involvement in the project grew. Some of the projects that they have been working on are presented by department below.

## Fire Department



Working with the fire department presents many challenges, since there are 14 different fire stations on 24-hour rotating shifts. This makes scheduling training difficult. Fortunately, the city has a video media channel, which they can use to provide the education. The type of work required of the fire departments can also make finding solutions a challenge. One of the identified needs of firefighters responding to a call is the quick access to various pieces of equipment – power saws, the “jaws of life,”

toolkits, first aid supplies, etc. Some of the equipment can be awkward and heavy, and how they are stored in the truck can make them even more awkward to lift. Newer fire trucks come with “sliders,” pullout shelves within the storage compartments that provide access to both sides of the equipment, reducing the awkwardness of the lift. The sliders make putting on their self-contained breathing apparatus (SCBA, essentially oxygen tanks and a mask) much easier. In less ideal situations the SCBAs were stored in the truck seats, where they could get tangled; making exiting the truck difficult or they were stored and donned at the scene. Now they are at a height where the firefighters can pull out the slider and just put the straps on and go.



Other major challenges for the Fire Department include the transport of obese or large patients. This is still an area of focus and is not easily solved because of the variable working conditions. However, it has been identified that multiple heavy lifts in the same shift can contribute to the frequency of back strains.

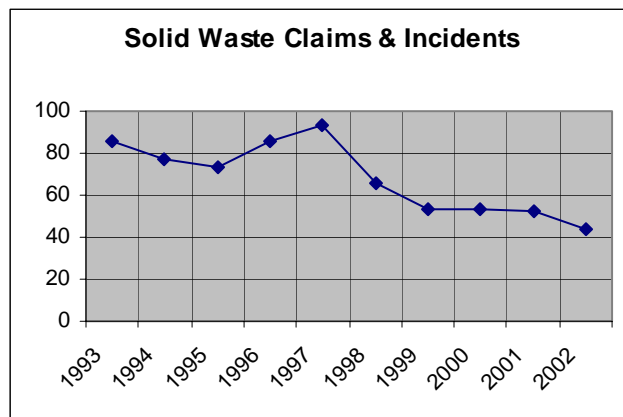
## Police Department

Within the Police Department, there was a trend of musculoskeletal injuries that occurred while capturing or detaining suspects who were resisting arrest. As a non-lethal

alternative, the department is now using Tasers to temporarily disable violent offenders so that they can be taken into custody without significant injury to either the suspect or officer. Tasers have been touted by other law enforcement agencies as reducing injury rates by as much as 80 percent according to Sheriff Kevin Beary from the Orange County Sheriffs Department in Florida. Spokane Officers had already been receiving training in “verbal judo” techniques. The “verbal judo” gives Officers another tool to avoid confrontations from turning into physical struggles.

## Garbage and Recycling Collection

Collecting garbage can require heavy, frequent and awkward lifting and has historically resulted in a considerable number of back and shoulder injuries. To help make this job safer, the city has converted many of its routes to automated trucks in 1998. These trucks use a joystick-controlled hydraulic arm to pick up and dump garbage from standardized containers at the side of the curb, essentially eliminating lifting hazards. Since implementing these trucks, the city has seen a steady decline in injuries in this department, accompanied by an increase in efficiency. Recycling collection was also a concern, since drivers had to sort materials at the side of the truck. To help reduce hand force, the city modified the trucks with a lip that the drivers could hook the side of the recycling bin onto. This allowed the truck to support the weight so that the employee would not have to hold onto the bin while they sorted from it. The Solid Waste Department is continuing to look at processes to improve safety and efficiency in this area, but the success of their past efforts is well documented by the decrease in their injury claims.



## Sewer Maintenance

One of the significant issues with sewer maintenance is lifting manhole covers, often called “vault lids,” since they can be very heavy and are sometimes impacted, or stuck in place. There are several different types of manhole cover lifting devices that provide leverage, so that workers are pushing down on a pry bar instead of lifting up on a hook. The department has been evaluating different devices to see which are easiest to handle and will work well in the snowy conditions that occur in Spokane. They are also

exploring the possibility of pneumatic tools hooked into the already existing compressed air systems on some of the trucks.

## Street Maintenance

Spokane has been working to update their traffic lights, a task that at first required two crews working in elevated buckets to hang the new lights, which are awkward and heavy to handle. Working on their own, the crews were able to create a simple fixture that hooked onto the bucket and held the traffic light at the necessary height. They were then able to wire up the new light while it was held in the fixture, using only one crew instead of two. The innovation significantly reduced the lifting hazard.



## Parking Meter Collection

Collecting change from the many parking meters around the city requires walking for miles while pushing a small cart used to contain the coins as they're collected. Issues that the workers had with current carts were difficulties in going up and down curbs, through snow, and down hills. To help with the design, Risk Management approached the local junior college's engineering class. Students each term take turns proposing different designs, with features such as large, bicycle-style wheels, a third wheel to help negotiate curbs, adjustable handlebars to help keep workers' wrists straight, a brake to help reduce effort when going downhill, a change container that can be emptied from the bottom without lifting it off the cart, and even water bottle holders to help workers stay hydrated on hot days. The city benefits from the free design help, while the engineering class gets to practice their skills on a real world design problem. They currently have three prototypes that they are getting ready to test in the field.

Coin collection personnel also have to sort, count and bag all the change that is collected, with help from the Treasure's Office. The change counting hopper was too high for some and the handle on the change sorting trays further aggravated the task.



The handle was changed to a coffee pot style vertical handle at first, and then modified again to the most comfortable angle, which turned out to be about 40-degrees down from the original. The handle modification is preferred by some, while a second sorter was left with the original handle (as in the first picture) for others.



## Wastewater treatment

The wastewater treatment facility is currently being remodeled, with ergonomics being one of the things considered in the redesign. For example, adjustable height workbenches for the laboratory are being considered in the current remodeling plans. Another problem being addressed is opening and closing valves, which involves turning hand wheels that often can become frozen, or rusted in place, making them very difficult to turn. Electronic valves are being installed in their place, eliminating the hand force and awkward postures previously required.

## Gardeners

City gardeners are kept busy growing plants to help maintain public spaces. Concerns that they have include lifting bales and buckets of ingredients that go into making fertilizers and soils, lifting of cold frames used to help grow plants in the wintertime, and hand force and awkward postures when watering the many plants by hand with a hose.



One solution implemented is a newly designed greenhouse that will eliminate the lifting of cold frames. A drip irrigation system is also being considered; automatic watering will save time and greatly reduce watering by hand. They are currently working on ways to mix fertilizers and soils without the multiple lifting steps in the current process.

## Office work

In addition to having ergonomics delegates evaluate workstations, Risk Management has also developed a CD-ROM with step-by-step instructions on how to set up a workstation. They are also distributing a workbook developed by University of California, Davis, in which employees find problems similar to theirs on a list, which then refers them to some potential solutions. These are two additional resources that delegates have in addition to the rule-related checklists,



which have limited application to computer work. Other efforts include working with the local office furniture vendor to bring in samples of adjustable workstations and “demo chairs,” samples of adjustable chairs that workers can try out for a period of time before purchasing. Purchasing guidelines for office furniture are being rewritten, so that departments will stop purchasing furniture simply because it’s what they’ve always had. Much of the older furniture was designed before computers were common in offices, and is inappropriate for computer use. The eventual goal is completely adjustable computer workstations, which will be achieved slowly as furniture wears out and is replaced. Once all of the current staff who need evaluations have been helped, the delegates will begin assessing new employees as they join the staff.

## On-going process

The city has not yet analyzed all of their jobs or found solutions for all of the hazards or other areas of concern that they have found. However, they are on schedule to have this work completed by the deadlines in the rule. Their focus is on continuous improvement, so no doubt the process will continue beyond just complying with the rule (already, many of the innovative solutions described above address issues that would not be considered “WMSD hazards” under the rule). Every August is now “Ergonomics Month”, and they use this opportunity to conduct additional training of delegates and keep awareness levels up. August will also be the time of year when the city will do its annual review of ergonomics activities as required by the rule. Risk Management also collects interesting articles and information on ergonomics and sends out periodic “news-clips” to the delegates. One of the goals of continuing the educational process is to keep everyone aware that ergonomics can go beyond the caution and hazard zones written into the rule, and it can have additional benefits such as improved productivity. With all of the different departments, there is always training going on, as new delegates come in to replace staff who move on. To avoid being overburdened, Risk Management has taken on a consultative role, allowing the delegates to do most of the analysis and problem solving work. When a difficult problem arises, the delegates then bring that back to Risk Management, who conducts a problem solving focus group to arrive at a solution.

Many of the materials developed by the City of Spokane can be found on their web site:  
<http://www.spokanecity.org/departments/default.asp?departmentID=42>