Ontario Ergonomics Cost-Benefit Calculator - Instructions for Use

Adapted from Washington State Department of Labor and Industries and Puget Sound Human Factors and Ergonomics Society's instructions (2016 version) by CRE-MSD in 2023.

This calculator is intended to be used under the following conditions:

- You're an Ontario company registered with the WSIB (either schedule 1 or schedule 2) for workers' compensation claims
- You have an active ergonomics program and understand intervention implementation and financial implications.
- You're considering implementing one or more ergonomics solutions to address specific problems (e.g., back and shoulder injuries from lifting).
- You'd like to evaluate a few different options.
- You're expecting a payback period of less than one year. (The payback period is the time that it takes for the benefits of a solution to pay for the costs of implementing it. Most ergonomics solutions have a payback period of less than one year.)

See the last page of this document for a more thorough list of assumptions for the calculator.

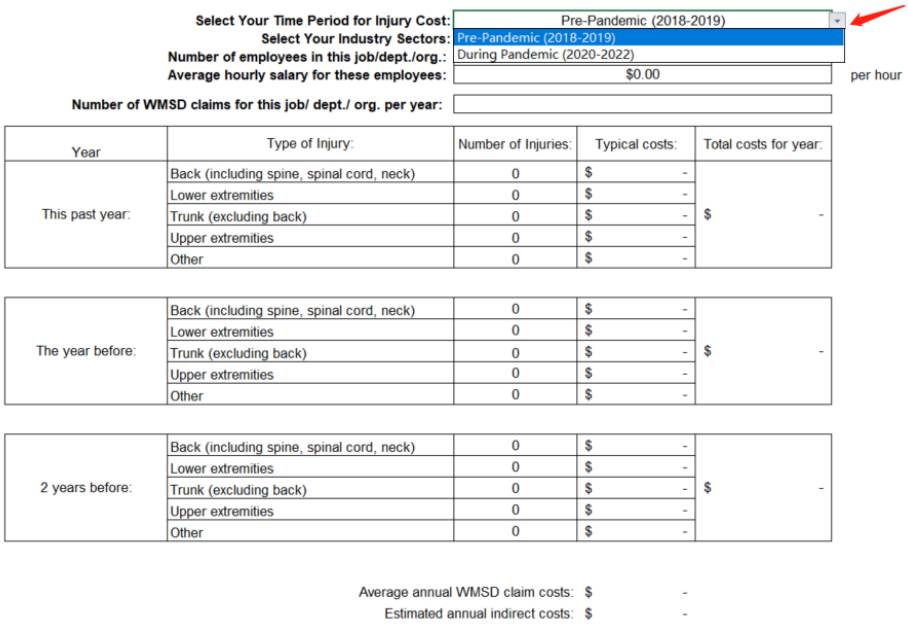
General Instructions

Note: The Excel file uses macros to make calculations. You may need to change your security settings in Excel (Tools → Option → Security tab) to allow macros in order for the spreadsheet to work properly.

Important: Save a back-up copy of the calculator before you make inputs. You should also save the calculator using a new name each time you use it. That way, if you accidentally delete one of the formulas, you will still have a fully functional copy in reserve.

You only need select appropriate options using the drop-down menus and input information into the boxes. Everything else will be calculated automatically.

First, select the time period for your company's injury cost.

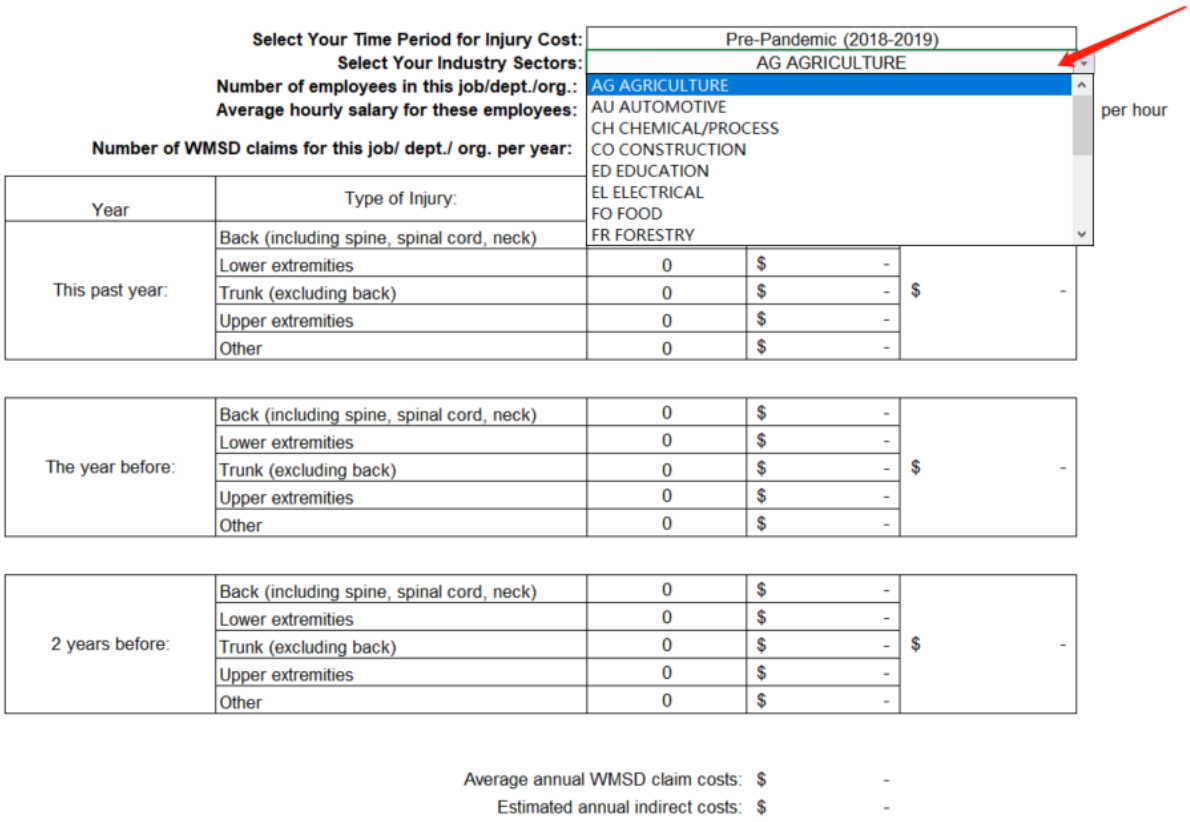


Select Your Time Period for Injury Cost:	Pre-Pandemic (2018-2019)
Select Your Industry Sectors:	Pre-Pandemic (2018-2019)
Number of employees in this job/dept./org.:	During Pandemic (2020-2022)
Average hourly salary for these employees:	$0.00 per hour
Number of WMSD claims for this job/ dept./ org. per year:	

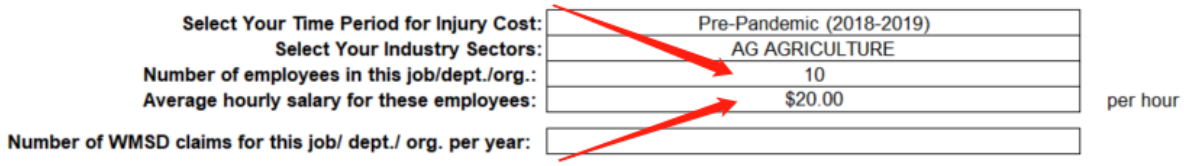
Year	Type of Injury:	Number of Injuries:	Typical costs:	Total costs for year:
This past year:	Back (including spine, spinal cord, neck)	0	$ -	
	Lower extremities	0	$ -	
	Trunk (excluding back)	0	$ -	$ -
	Upper extremities	0	$ -	
	Other	0	$ -	
The year before:	Back (including spine, spinal cord, neck)	0	$ -	
	Lower extremities	0	$ -	
	Trunk (excluding back)	0	$ -	$ -
	Upper extremities	0	$ -	
	Other	0	$ -	
2 years before:	Back (including spine, spinal cord, neck)	0	$ -	
	Lower extremities	0	$ -	
	Trunk (excluding back)	0	$ -	$ -
	Upper extremities	0	$ -	
	Other	0	$ -	

Average annual WMSD claim costs:	$ -
Estimated annual indirect costs:	$ -

Second, select the industry sector that corresponds to your company's primary field of operation.



Input only the number of employees who will be affected by the solutions you are considering. For example, you may have 50 total employees in your manufacturing department, but only 10 of them would use the lifting device you're considering.



Enter the average hourly salary for these employees. You don't need to type in the dollar sign. It will be formatted automatically. You will have to put in the decimal point if it's not a whole dollar amount (e.g., for $14.50, type in 14.5).

Input the body parts where workers have experienced MSD injuries. Select only the body parts of injuries that are likely to be reduced by the solutions you're considering.

Enter the number of each type of claim in this column.

These values will calculate automatically

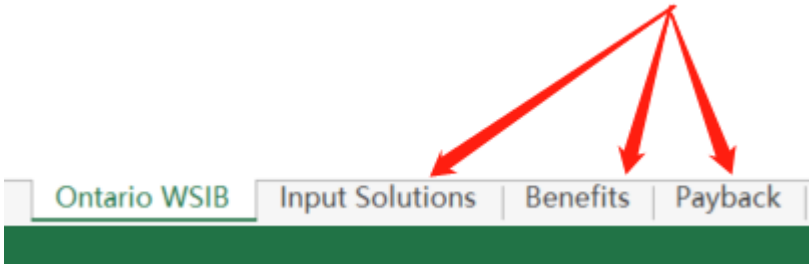
Year	Type of Injury:	Number of Injuries:	Typical Costs:	Total Costs for Year:
This past year:	Back (including spine, spinal cord, neck)	1	$ 8,727	
	Lower extremities	0	$ -	
	Trunk (excluding back)	0	$ -	$ 8,727
	Upper extremities	0	$ -	
	Other	0	$ -	
The year before:	Back (including spine, spinal cord, neck)	0	$ -	
	Lower extremities	0	$ -	
	Trunk (excluding back)	0	$ -	$ 20,936
	Upper extremities	3	$ 20,936	
	Other	0	$ -	
2 years before:	Back (including spine, spinal cord, neck)	1	$ 8,727	
	Lower extremities	0	$ -	
	Trunk (excluding back)	0	$ -	$ 15,706
	Upper extremities	1	$ 6,979	
	Other	0	$ -	

Average annual MSD claim costs: $ 15,123

Estimated annual indirect costs: $ 17,450

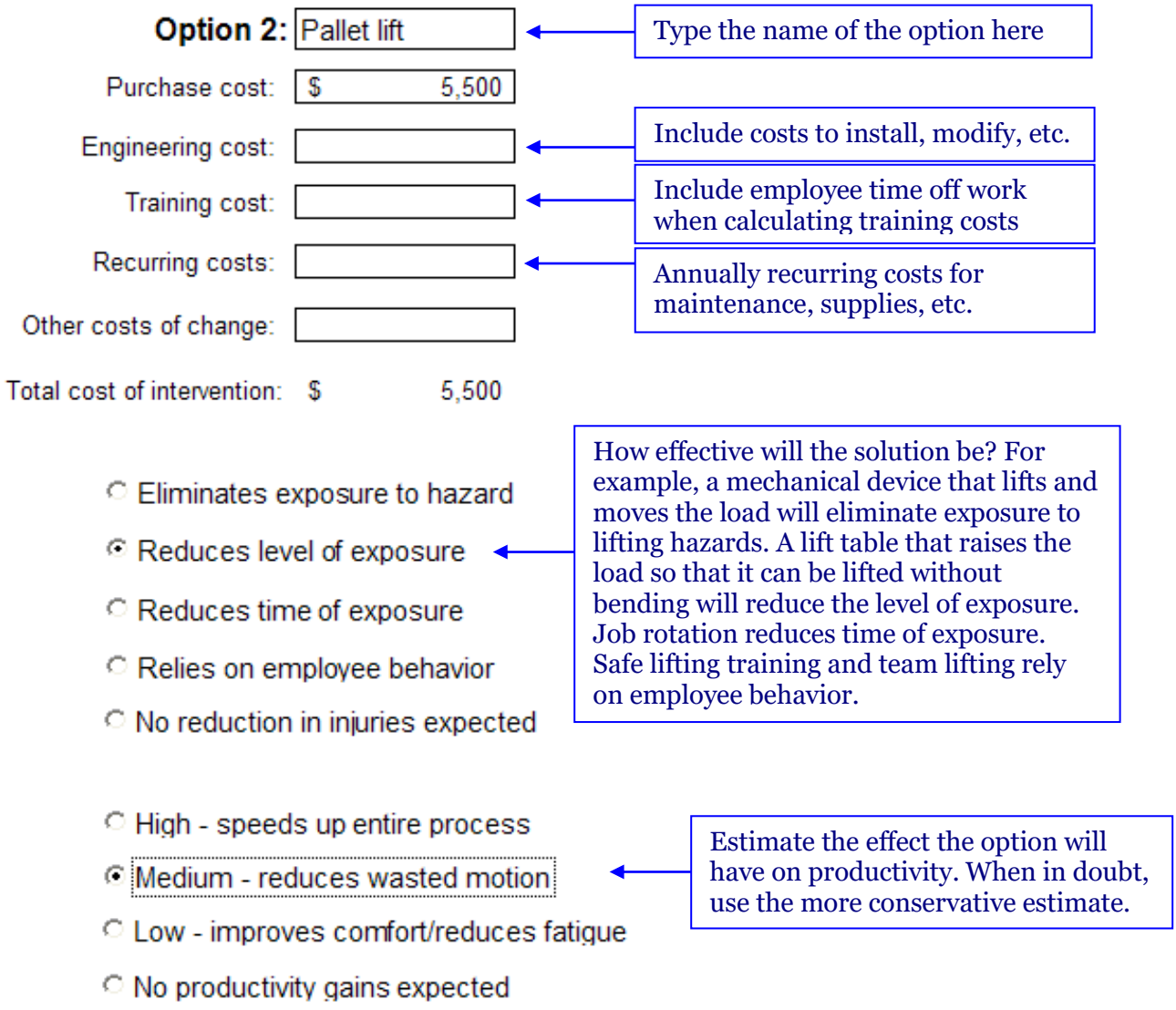
Each year can be any 12-month period. You must enter claims information for all three (3) years for the average costs to calculate correctly.

Move from one worksheet to the next using the tabs at the bottom of the screen.



Input Solutions

You can input up to three different options you are considering. A typical option for comparison purposes is "do nothing," which involves no costs of changes, but also has no benefits.



Benefits

Estimated benefits for solution options

Option 1 Job Rotation		
Reduction in claims:		15%
Reduction in workers' comp costs:	$	3,025
Reduction in indirect costs:	$	3,490
Increase in productivity:		0.0%
Productivity value:	$	-
Other estimated savings:		
Total estimated annual savings:	$	6,515
Total estimated savings over 3 years:	$	19,544
Total estimated savings over 5 years:	$	32,573

Option 2 Pallet Lift		
Reduction in claims:		40%
Reduction in workers' comp costs:	$	6,049
Reduction in indirect costs:	$	6,980
Increase in productivity:		5.0%
Productivity value:	$	17,000
Other estimated savings:		
Total estimated annual savings:	$	30,029
Total estimated savings over 3 years:	$	90,088
Total estimated savings over 5 years:	$	150,147

Estimated benefits from the solution options that you input are calculated automatically and presented on the '**Benefits**' tab. Total estimated annual savings are the potential savings the first year after implementing that solution option. Estimated savings over three- and five-year periods are also calculated. The cost of implementing the solution is not subtracted out (i.e., these are not net savings). Estimated net savings are shown on the 'Payback' tab.

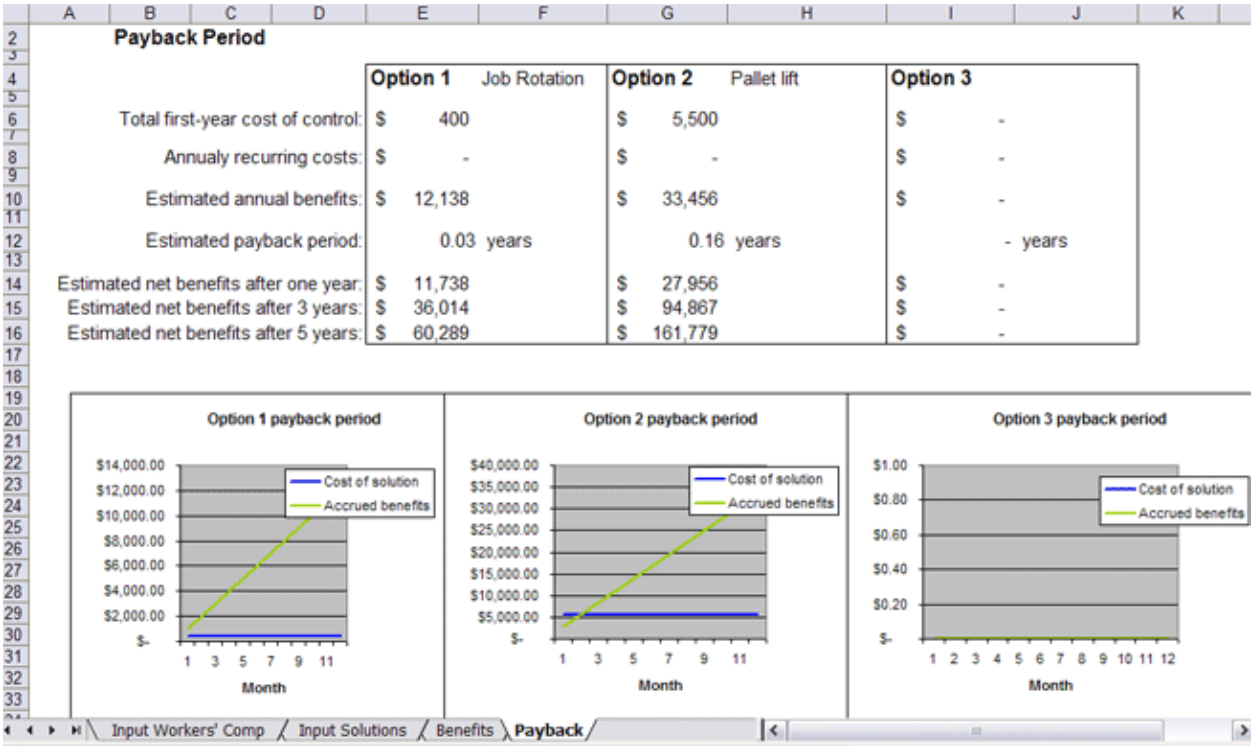
Solution Effectiveness Estimates

Type of Solution	Reduction in Claims
Eliminates exposure	70%
Reduces level of exposure	40%
Reduces time of exposure	15%
Relies on behaviour	10%

Productivity Improvement Estimates

Level of Increase	Percent Increase
High: speeds up process	10%
Medium: reduces wasted motion	5%
Low: improves comfort/fatigue	2.5%

Payback



Payback Period

	Option 1 Job Rotation	Option 2 Pallet lift	Option 3
Total first-year cost of control:	$ 400	$ 5,500	$ -
Annualy recurring costs:	$ -	$ -	$ -
Estimated annual benefits:	$ 12,138	$ 33,456	$ -
Estimated payback period:	0.03 years	0.16 years	- years
Estimated net benefits after one year:	$ 11,738	$ 27,956	$ -
Estimated net benefits after 3 years:	$ 36,014	$ 94,867	$ -
Estimated net benefits after 5 years:	$ 60,289	$ 161,779	$ -

Total costs, total benefits, and net benefits for the first year are shown on the '**Payback**' tab. The payback period is calculated and shown graphically for each option. Most ergonomic solutions have payback periods of less than one year. If you find a payback period that is significantly greater than one year, you should use a cost-benefit calculator that allows you to factor in depreciation and a discount rate.

If at any point you have questions, please contact info@msdprevention.com

Assumptions for Ontario Ergonomics Cost-Benefit Calculator

Intended Use:

- Ontario companies registered with the Workplace Safety and Insurance Board (WSIB)
- Implementing solution(s) in defined area (i.e., not a company-wide program)
- Company has active ergonomics program with all recommended elements and solutions will be effective
- Can compare up to three options
- Expecting payback in less than one year (i.e., not considering depreciation, discount rate)

Injury costs:

- Ontario WSIB claim count and cost data from 2018-2022
- Costs in Canadian dollars
- Average costs used instead of actual company costs because recent injuries may not have incurred eventual total cost of claim.
- Three years of experience used to be consistent with workers' compensation.

Indirect costs:

- From OSHA Safety Pays e-tool: https://www.osha.gov/safetypays/tool
- Less expensive claims have proportionally higher indirect costs.
- $0 - $2,999 = 4.5 x claim cost
- $3,000 - $4,999 = 1.6 x claim cost
- $5,000 - $9,999 = 1.2 x claim cost
- $10,000+ = 1.1 x claim cost

Effectiveness of solutions:

- Based on Oxenburgh's (1991)[1] assumptions & review of 250 case studies of ergonomics interventions.
- Effectiveness estimates were taken from the low end of the range to be conservative.
- Solutions that eliminate hazard (e.g., lift equipment, semi-automation): 70% effective.
- Solutions that reduce the level of exposure (e.g., adjustable workstations, reduced weight of lift): 40% effective.
- Solutions that reduce time of exposure (e.g., job rotation): 15% effective.
- Solutions that rely on employee behavior (e.g., training only, team lifting): 10% effective.
- Percentage reduction in claims = percentage reduction in claims costs = percentage reduction in indirect costs.

Productivity benefits:

- Employers pay for 2,000 hours per year per worker, at $x.xx per hour.
- Workers are not 100% productive and may be only 85% productive or less under non-optimal work conditions.
- Ergonomics solutions can help to regain some of the lost 15% productivity by improving work conditions and increasing efficiency.
- Median increases in productivity for successful controls from the case studies in the 15% to 20% range, but how productivity measured is not known, probably varies widely.
- Conservative estimates were chosen.
- High productivity increase: 10%, medium: 5%, low: 2.5%.
- Value of productivity equal to the annual cost of worker salaries multiplied by percentage increase in productivity.

[1] Oxenburgh, M. (1991). Increasing productivity and profit through health and safety. Australia: CCH International.