



JOB DEMANDS ANALYSIS

Company: City of Vancouver

Location: Transfer Station

Job Title: Truck Driver 4

Classification: Regular Duty

Purpose of Activities

The Truck Driver 4 is responsible for safely transporting garbage from the Transfer Station to the Burns Bog landfill site.

Tools and Equipment

The Truck Driver 4 will use the following tools and equipment to perform his duties:

- Tractor-Trailer unit (with adjustable seat)
- Various controls (levers, buttons, knobs) and radio equipment used to carry out regular vehicle operations and communications
- Hand tools - mallet or similar tool to extrude rocks etc. wedged in tires when leaving landfill

Usual Methods

The following will be carried out about 4 times each day.

1. Perform a pre-trip vehicle safety check.
2. Back the vehicle under the loading bay at the Transfer Station to fill the trailer with garbage.
3. Communicate, by two-way radio with crane operator to ensure top of vehicle is clear of debris, and the vehicle can be safely driven away from the loading bay.
4. Drive forward until the tractor-trailer is clear of the loading bay and then stop the unit. Exit the cab of the tractor-trailer and close the gates covering the top of trailer by a manual lever. This lever is located on side of trailer.
5. Climb back into the tractor-trailer cab.
6. Drive the tractor-trailer unit to the landfill (involves passing through vehicle weigh-scale station).
7. Back the tractor-trailer to the dumping location.
8. Exit the tractor-trailer cab.



9. Walk to the back of tractor-trailer. Operate the manual lever to open the rear gate on the trailer. Return to the tractor-trailer cab.
10. Initiate unloading process by the right hand manual controls in the tractor-trailer cab.
11. Drive the tractor-trailer forward once the load has been dumped and then stop the tractor-trailer. Get out of tractor-trailer cab, close gates with the manual lever. Perform the vehicle safety check.
12. Drive the tractor-trailer to Transfer Station.
13. Repeat steps 1-12 three more times throughout the shift.

Administrative Issues

The Truck Driver 4 position involves two shifts: 0600 to 1430 and 1400-22:30, Monday to Friday with a 30 minute lunch break. The number of vehicles dispatched per shift depends on the volume of garbage that is transferred to the landfill. Any repairs and mechanical maintenance needed to the vehicle are recorded on a standard form by the Truck Driver 4 and submitted directly to the mechanics' shop.

Activity Demand Variables

These variables are tasks that must be carried out by the employee and are implicitly or explicitly required as objectives of the job.

- Walk around, bend, stoop, crouch, kneel and crawl to perform vehicle inspection (visual, tactile, auditory)
- Manually operate top and rear gate controls located on trailer.
- Conduct radio communications with two-way radio
- Sit in the tractor-trailer while driving and loading/unloading the tractor-trailer
- Climb in/out of vehicle cab
- Drive the tractor-trailer through urban (often-heavy) traffic.
- Operate controls on console

Worker Decision Variables

These variables are the sub-routines and cognitive/physical decisions made by the worker in carrying out the objectives of the job.

- Choose postures for carrying out duties (sitting, standing at landfill or Transfer station.
- Operate tractor-trailer unit in traffic.
- Schedule breaks or lunch.



Accommodative Considerations

1. People with injuries to the spine in any region may have difficulty with the predominantly seated postures, which also involve jarring and vibration, especially on the landfill roads.
2. People with any upper extremity problems may have difficulty with the steering, constant gear-shifting and reaching console controls.
3. People with lower extremity problems (which are aggravated by repetitive actions) may have difficulty with the constant foot-peddle operations and getting in/out of the tractor-trailer cab.
4. People with post-whiplash and other neck problems may have difficulty with this position.
5. The sitting required for this position would aggravate individuals with hemorrhoids.
6. Individuals who do not cope with (heavy) traffic related stress would have difficulty with this position.
7. Class 1 Licence with Air Brake Endorsement required.

Kevin Antonishen
Kinesiologist

September 1999



Summary of Stresses

Metabolic Stresses

The aerobic energy system will provide the major source of energy for the Truck Driver 4. This position is primarily sedentary with low level energy expenditure while driving the truck, operating the console controls and loading and unloading trailer unit. It is not likely that the anaerobic energy system will be required to provide energy for the Truck Driver 4.

Structural Stresses

Spine – The sedentary nature of this work can place significant passive loads on the spinal structures. Prolonged sitting increases disc compression forces. A flexed spine sitting posture requires no activity from the torso musculature, but increases asymmetrical disc compression and passive stretch on the posterior ligaments and disc fibres. This forward flexed posture can contribute to disc integrity problems over time as well as decondition the torso support musculature. This passive stretch on the ligaments (ligament creep) de-stabilizes the spine and any maximal lifting, carrying, pushing or pulling immediately after prolonged sitting will increase the risk of injury.

Neck, Shoulders and Upper Extremities – Due to the static positions required and the frequent reaching for the steering wheel and gear shift, the muscles in the rotator cuff of the shoulder (especially right) and the upper trapezius and scalene muscles of the neck, maintain significant and often constant static load. Resting the left elbow on the driver's side window will have the same negative effect as described above. Also, if the Truck Driver 4 is too low in his seat, with respect to the steering wheel, gear shift and driver's side window, the load on the neck and shoulders is increased as the arms must be lifted and held in a static position to steer the truck and shift gears. Constant use of the truck's side mirrors, specifically when maneuvering the tractor-trailer will increase the static tension in the upper trapezius and scalene muscles as well.

Hips and Lower Extremities – Prolonged sitting is likely to shorten the hamstring muscle group of both legs. This in turn will pull the pelvis under the body and prevent the Truck Driver 4 from sitting on the sit bones (Ischeal Tuberosity) and promote the undesirable forward flexed spinal posture. Slip and fall injuries while getting in or out of the truck cab are increased during wet weather or wet working conditions. Walking on uneven terrain in the landfill will increase the risk of twisting the ankle and/or knee.



INTERVENTIONS

Recommendations that could be implemented to increase productivity and lessen the risk of injury are listed below:

1. Teach the Truck Driver 4 to set up the adjustable seat to adopt neutral sitting postures (hip angle, spine, shoulders, elbows and wrists) which will decrease the risk of injury to the spine and upper extremities.
2. Encourage the Truck Driver 4 to maintain an increased level of fitness away from work that will focus on cardiovascular endurance, muscular strength, muscular endurance and flexibility.

Referral: Debbie Craig		Organization: City of Vancouver						Title: Truck Driver		
Dept.: Engineering		Division: Solid Waste						Contact:		
		FREQUENCY*						Date: September 1999		
PHYSICAL DEMANDS		R E Q D	S I D E	Sel 1	Low 2	Mod 3	High 4	Max. Weight (kg)	Usual Weight (kg)	COMMENTS
S T R E N G T H	Lifting - Floor to Knuckle									
	Lifting - Knuckle to Waist									
	Lifting - Waist to Shoulder									
	Lifting - Over Head									
	Carrying - With Handles									
	Carrying - Without Handles									
	Pushing - Upper Extremity	X	R				X	<10	<5	compound movement-steering, shifting gears
	Pushing - Hip/Leg Assist						X	<10	<5	open/close gate, steering
	Pulling - Upper Extremity	X	R				X	<10	<5	compound movement-shifting gears
	Pulling - Hip/Leg Assist						X	<10	<5	open/close gate, steering
	Reach - Shoulder or Above	X	E		X			BW	BW	getting in vehicle
	Reach - Sho. or Above extnd							BW	BW	getting in/out of truck
	Reach - Below Shoulder	X	E		X			<10	<5	Console controls, gate pins, shifting, steering
	Reach - Bel. Shoulder extnd	X	R		X			<10	<5	shifting gears
E N E R G	Handling									
	Gripping	X	B					<20	<5	steering/shifting, manual gate lever
	Fine Finger Movements	X	R		X			mod	low	control buttons, dials
P O S T U R E +	Aerobic (percent)	X					100	low level sedentary , sitting, vehicle inspection, open/close gate		
	Anaerobic (percent)									
	High Energy Expenditure									
	Low Energy Expenditure	X					X	low level sedentary , sitting, vehicle inspection, open/close gate		
M O B I L I T Y	Neck - Static Flexion	X				X		view road when driving		
	Neck - Static Neutral	X					X	sit to drive, walk, stand		
	Neck - Static Extension	X			X			climb in/out of truck cab, close/open gates on trailer top (5 sec)		
	Neck - Rotation	X	E				X	driving - shoulder checks, vehicle inspection		
	Throwing									
	Sitting	X					X	driving, prolonged periods greater than one hour at a time		
	Standing							safety inspection, walk around truck, at landfill, short distances		
	Walking	X			X			vehicle safety check, open/close gate		
	Running/Jumping									
	Climbing - Arms and Legs	X			X			in/out of vehicle		
	Climbing - Legs Only									
	Bending/Stooping	X			X			vehicle safety check		
	Crouching	X			X			vehicle safety check		
	Kneeling	X			X			possibly during vehicle inspection		
	Crawling	X		X				possibly during vehicle inspection		
	Twisting	X			X			vehicle inspection, climb in/out of truck,		
	G E N E R A L	Balancing								
Traveling		X					X	from Transfer Station to landfill		
Work Alone		X					X	drive/operate tractor-trailer unit		
Interact with Public		X					X	driving in traffic		
Operate Equip/Machinery		X					X	tractor-trailer unit		
	Irregular/Extended Hours	X					X	may require extended hours; 14:00-22:30 shift		

* Frequency Legend 1 = Seldom; Not Daily 2 = Low Daily Activity; < 1hr
 3 = Moderate Demand; Repetition 1 - 3 hrs daily 4 = High Frequency Demand; Repetition > 3 hrs daily
 The following shading denotes a HIGH RISK TASK: Modifications should be considered

REQD is marked with an X if the particular demand or category is relevant to the purpose of the job.

SIDE refers to the side or limb required to execute a task. If it is marked **E**, it indicates either side, the most common choice is listed first. **D** refers to dominant and **B** to both sides.

Referral:		Organization:						Title: see 1st page header	
Dept.:		Division:						Contact:	
PHYSICAL DEMANDS		R E Q D	S I D E	FREQUENCY*				COMMENTS	
				Sel. 1	Low 2	Mod. 3	High 4		
P E R C E P T I O N	Hearing - Conversations	X				X	2-way radio, scaleman, loading bay worker		
	Hearing - Other Sounds	X				X	vehicle and traffic sounds		
	Vision - Far	X				X	drive in traffic		
	Vision - Near	X				X	console controls		
W O R K E N V I R O N M E N T	Vision - Colour						traffic lights, street signs		
	Vision - Depth	X				X	vehicle positioning at landfill. Transfer Station, drive in traffic		
	Perception - Spatial	X				X	drive in traffic, maneuver the tractor-trailer at landfill/Transfer Station		
	Perception - Form								
I N S I D E	Feeling (Tactile)	X				X	transmission shifting, manual gate open/close		
	Reading	X					street signs, daily log/reports		
	Writing	X		X			mechanical requests, daily log/reports		
	Speech	X			X		2-way radio		
W O R K E N V I R O N M E N T	Inside Work	X				X	in tractor-trailer cab		
	Outside Work	X			X		vehicle inspection; open/close gates		
	Hot Conditions >25 deg. C	X		X			possibly in spring, summer, fall		
	Cold Conditions <10 deg. C	X		X			possibly in fall, winter, spring		
W O R K E N V I R O N M E N T	Humid	X		X			rainy season		
	Dust	X		X			from ground, seasonal pollens, etc.		
	Vapor Fumes	X				X	diesel fumes, traffic exhaust		
	Hazardous Machines	X				X	drive/operate tractor trailer unit		
W O R K E N V I R O N M E N T	Proximity to Moving Object	X			X		drive tractor-trailer in traffic, at landfill outside of truck near dozer		
	Noise	X				X	tractor-trailer noise, traffic noise		
	Electrical Hazard								
	Sharp Tools			X			possibly small hand tools		
W O R K E N V I R O N M E N T	Radiant/Thermal Energy	X		X			sun burn, hydraulic hoses, overheated tractor-trailer		
	Slippery Conditions	X		X			wet pavement, snow and ice on road, wet landfill		
	Vibration and Related	X				X	road conditions (landfill site), jarring and compression on spine		
	Chemical Irritants	X		X			possible exposure at landfill		
W O R K E N V I R O N M E N T	Organic Substances	X			X		direct contact at landfill or operating manual gate		
	Medical Waste								
	Blood Products								
	Congested Worksite	X				X	traffic, cab of tractor-trailer		
W O R K E N V I R O N M E N T	Lighting - Direct	X				X	day light, sun light, head lights, street lights		
	Lighting - Indirect	X				X	day light, sun light, head lights, street lights		
	Lighting - Adjustable								
	Lighting - Fluorescent								
W O R K E N V I R O N M E N T	Lighting - Incandescent								
	Lighting - Shadows etc.	X		X			depends on time of day and location		

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For detailed descriptions of each of the different categories, please refer to the reference guide or inquire with Human Effort at 1-888-4EFFORT