



Reduce harmful work stressors.  
Improve job quality and health.

# Healthy Work **Strategies**

## **Intervention to reduce job stress among urban bus drivers in Stockholm, Sweden**

An intervention project in the city of Stockholm, Sweden, focused on reducing some of the sources of stress at work of bus drivers. They identified various sources of stress, including pressure to drive safely, obstacles to staying on schedule, such as traffic congestion and attention to passengers' needs, such as help getting on or off the bus, road construction, mechanical difficulties, and risky behaviors of other drivers, cyclists, and pedestrians.<sup>1,2</sup>

### **How did the project come about?**

Originally Stockholm Transport, a municipal transit agency, undertook the intervention to reduce traffic congestion, increase speed, and improve passenger service along one of the most congested urban bus routes in Stockholm. But a transit research team saw an opportunity to learn whether the project would also improve bus drivers' health by reducing stressful traffic congestion, and reducing time consuming passenger inquiries through automated technology that would provide schedule information to riders.

The transit research team – from Stockholm University, Stockholm, Sweden and Cornell University, Ithaca, New York, and not affiliated with Stockholm Transport – realized that the intervention project would provide a chance to see if reduction in traffic congestion and work stressors that slowed the pace of bus drivers' work would reduce driver stress and improve driver health. The research team proposed this additional idea, a “complementary perspective” called the “Human Side of the Road”, to Stockholm Transport, and the agency agreed to it.

The researchers and transit labor union representatives met in several forums with drivers to discuss the design and purpose of the study. Questionnaires were mailed to participants' home addresses, along with instructions, an explanation of the purpose of the study, a confidentiality assurance, and a letter from the local labor union indicating union support of the study.

## What was changed

Stockholm Transport designed a bus route that featured physical changes to improve the efficiency of bus operation and used technology to reduce traffic congestion (on the “intervention route”), and compared it to similarly congested bus routes in Stockholm that had not been changed. The municipal transit agency thought that if they reduced traffic congestion and the drivers’ need to answer some passenger questions and provide directions, operators would be able to focus on safe driving with less time pressure, and transit traffic would move faster. The following changes were carried out along the intervention route:

- Separate bus lanes for areas with high traffic congestion
- Improvements of difficult turns and areas with traffic bottlenecks
- A traffic signal system that gave buses higher priority
- Construction of passenger peninsulas that reduced drivers needing to pull over to a curb, and reduced the number of illegally parked cars, which can slow transit traffic
- Design and installation of electronic information systems in buses for passengers’ benefit, reducing the need for passengers to ask questions
- Installation of electronic information systems at major bus stops to let passengers know how soon the next bus would arrive

## Evaluation of the intervention

There were 10 drivers in the intervention group and 31 in the comparison group. Five drivers dropped out over the course of the study, leaving 9 and 27 participants in the two groups. Data were collected on one weekday from the beginning of the shift until the lunch break, in March and April 1991 before the intervention, and on one day in September and October of 1992 after the intervention. Before starting a shift, bus drivers met a research assistant and filled out background and health history questionnaires, and the research assistant measured blood pressure (BP) and heart rate. The bus driver and research assistant boarded the bus together, and the research assistant recorded observations about job stressors and again measured BP and heart rate at several parts of the route, which occurred between 5 and 9 times per shift.

	<b>Group</b>	<b>March 1991</b>	<b>October 1992</b>	
Systolic BP	Intervention	133.2	122.5	real decline
	Control	124.2	119.9	real decline
Diastolic BP	Intervention	87.3	83.8	change could be due to chance
	Control	79.9	78.7	change could be due to chance
Heart rate	Intervention	71.6	67.9	real decline

	Control	67.3	66.8	change could be due to chance
Distress after work	Intervention	2.08	1.69	real decline
	Control	1.38	1.27	change could be due to chance
Job hassles per hour	Intervention	15.8	11.3	real decline
	Control	10.9	11.5	change could be due to chance
Perceived stress	Intervention	2.1	1.7	real decline
	Control	1.4	1.3	change could be due to chance
		<b>1990</b>	<b>1992</b>	
Fatigue after work	Intervention	-0.18	0.05	change could be due to chance
	Control	-0.40	-0.41	change could be due to chance
Perceived workload	Intervention	1.92	1.65	real decline
	Control	0.85	0.92	change could be due to chance
Psychosomatic symptoms	Intervention	1.24	1.36	change could be due to chance
	Control	0.97	1.00	change could be due to chance
Note: "real decline" means a decline not likely due to chance				

The intervention appeared to be effective in reducing perceived workload, job hassles, systolic BP, heart rate and distress after work. However, no change was seen for diastolic BP, fatigue or psychosomatic symptoms. The researchers reported that being an intervention (vs control group) driver was related to drops in systolic BP, heart rate and perceived stress. Also, changes in job hassles were related to changes in systolic BP, heart rate and perceived stress.

## Conclusions

A program to improve traffic, including creation of separate bus lanes, passenger peninsulas to reduce the need to pull over, and electronic bus schedule information in buses and at bus stops appeared to be effective in also reducing stress, heart rate, and systolic BP among drivers. However, given the small number of drivers involved in this study, it was difficult to draw strong conclusions about the impact of this particular program.

## References:

1. Rydstedt, L. W., Johansson, G., & Evans, G. W. (1998). The human side of the road: improving the working conditions of urban bus drivers. *Journal of occupational health psychology*, 3(2), 161. Retrieved from <https://psycnet.apa.org/>.

2. Evans, G. W., Johansson, G., & Rydstedt, L. (1999). Hassles on the job: a study of a job intervention with urban bus drivers. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 20(2), 199-208. Retrieved from <https://onlinelibrary.wiley.com/>.