

Identification of Potential Risk Factors for Injury to Police Officers in Using New Technologies

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Principal Applicants: Axel Hovbrender, Retired (Police Academy) Justice Institute of BC
Silvia Raschke (BCIT Technology Centre)

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Issue

This project is aimed at identifying the limitations in police vehicle and equipment design that contribute to on-the-job injuries, and culminates in a set of recommendations for addressing those concerns. While police vehicles are now being used as mobile work stations, complete with computers and other new equipment, little has been done to address the ergonomic and safety problems arising from such changes. Additionally, as police officers become more representative of the greater population, differences related to sex, age, and body size need to be taken into consideration when designing police vehicle interiors and equipment. By tackling these issues, vehicles and gear can be improved to reduce the rate of equipment-related musculoskeletal injury (MSI) among police officers.

Key findings

- Although there is growing awareness of the importance of ergonomics, there is significant room for improvement in the design of police vehicles and duty belts to reduce the incidence of MSI.
- Central issues include: computers and mounts, vehicle seats, style and arrangement of duty belts, and organization/storage of equipment inside vehicles. Some problems have simple solutions that could be implemented immediately, while others require further evaluation and strategizing.
- If the ergonomic concerns identified by the participants are properly addressed, vehicle safety and police officers' musculoskeletal health may be improved.

Objectives

- To work with police (active duty and recruits) to identify key ergonomic issues related to vehicles and equipment
- To build a platform for further work and partnerships to develop concrete solutions for addressing the identified issues

Methods

The project was carried out in four stages:

1. Literature review (current technologies, research methodologies, outcomes of similar studies);
2. Practical observation (ride-alongs with uniformed and plain-clothed police officers on duty);
3. Focus groups (consultations with VPD members and JIBC recruits);
4. Questionnaires (administered following focus group discussions).

Data collected through the focus groups and questionnaires were compared and presented by category.

Results

- Location, height, and adjustability of computers and computer mounts inside vehicles are key issues for VPD officers. Computers and mounts can impede movement (e.g. to turn on lights and

sirens) and visibility. The positioning of light bars and cameras can also interfere with a driver's sightline.

- Vehicle seats pose multiple problems for safety and comfort. Normal wear is compounded by the gear carried on duty belts (including service weapons), which can tear upholstery and foam padding and create uneven surfaces. In vehicles with cages, seats can only be minimally adjusted and do not properly accommodate occupants who are not of average male height.
- Duty belts are overloaded with equipment, some of which inevitably is worn at the small of the back, leading to improper posture when seated in a vehicle. Participants overwhelmingly preferred nylon belts, which were perceived to be more practical and comfortable than leather.
- There is no systematic organization of materials and equipment within vehicles or trunk spaces – loose items are potential hazards in a moving vehicle.

Conclusions

The researchers lay out a series of recommendations in their report, including a design for a “dream car.” They note that items related to personal comfort were ranked significantly lower than ideas aimed at enhancing safety and efficiency. While the research focused on a relatively small group of participants from a single jurisdiction, it is clear that the concerns articulated by the police officers and recruits can be generalized to other regions and policing organizations.

Future directions

Because this project was small in scope, more exhaustive research would be needed in order to validate the findings. Nevertheless, several of the issues that have relatively simple, minimal cost solutions could be implemented immediately without further study. Some of the larger proposals could be tackled by a cross-departmental forum, such as the Ford Motor Company's Police Advisory Board. The researchers plan to work together to develop projects and initiatives stemming from the recommendations, and are available to partner with other organizations to move forward in addressing the participants' concerns.

The researchers recommend:

- Conducting a hazard analysis of computer mounts and centre consoles to find a better design;
- Considering sightlines when installing equipment in vehicles;
- Returning to the original dual armrest model of vehicle seating;
- Reviewing the policies of other policing agency regarding visibility of police vehicles and adjusting local practice (e.g. positioning of lights, tone and frequency of sirens);
- Conducting regular audits of police vehicle interiors to assess seating (upholstery, foam, mechanics) and locks and repairing/retrofitting equipment as appropriate;
- Providing better education to all drivers on correct adjustment of headrests and seatbelts;
- Reviewing options and best practices for duty belts (e.g. nylon vs. leather, placement of equipment);
- Forming a joint labour-management committee to track and implement best practices in police vehicle ergonomics.

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