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Driver Distraction in Public Transport: A Case Study

What is Driver Distraction?



“Driver distraction is a diversion of attention away from activities critical for safe driving towards a competing activity”

(Regan, Lee & Young, In press)

- Distraction involves a competing activity
- Distraction cannot be caused by pre-existing conditions, such as fatigue or alcohol or drug impairment
- Drivers can be distracted by poorly timed driving tasks

Background



- **Distraction contributes to between 10% and 23% of all road crashes**
- **Driving measures affected:**
 - Degraded lane keeping ability
 - Degraded speed control
 - Greater 'eyes off road' time
 - Miss or take longer to react to unexpected events
- **Almost nothing known about distraction in the public transport sector – but likely to be a significant problem**

The Bus Driving Environment



- **Urban bus driving is a high workload environment with conflicting demands**
- **Bus drivers are required to undertake additional tasks**
 - Monitoring passengers/passenger inquiries
 - Selling tickets
 - Keeping to time schedule and bus route
- **Combination of high workloads and additional activities can make bus drivers more vulnerable to distraction**

Bus Driver Distraction Study



Aims:

- Identify what sources of distraction bus drivers are exposed to
- Establish the impact of these distractions on driving performance
- Identify what can be done to minimise driver exposure to distraction

Study Phases



Three project phases

- Phase 1** Analysis of Functions and Tasks Undertaken by Bus Drivers
- Phase 2** Identification of Potential Sources of Driver Distraction
- Phase 3** Risk Assessment and Human Error Identification Analysis

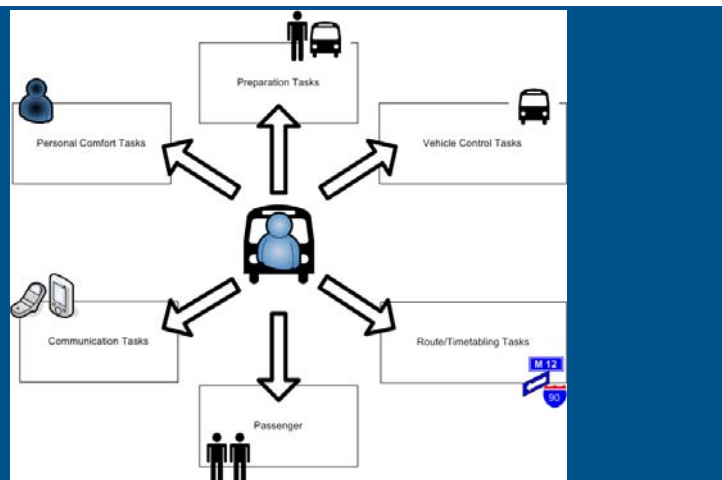
Phase 1: Method



Identification of driving and non-driving tasks conducted by drivers while operating buses

- Review of company documents
- Semi-structured and walk-through/talk-through style interviews with experienced bus drivers and driver trainers
- Three focus group discussions with sample of current bus drivers
- Observational studies on a range of bus routes

Phase 1: Bus Driver Tasks



Phase 2: Method



Identification of the sources of distraction that bus drivers are exposed to while operating buses

- Review of company documentation
- Three focus groups
- Observational studies on a range of bus routes
- Bus driver survey
- Ergonomic assessments of company buses
- Examination of selected company surveillance camera footage

Phase 2: Sources of Distraction



Technology	Operational	Passenger	Environmental	Bus Cabin	Infrastructure	Personal
Radio (V)	Issuing tickets (V)	Passenger conversations	Weather conditions	Annoying rattles (cabin door, ticket machine)	Advertising	Incapacitation (DUI) (V)
Handset (V)	Listening to radio broadcasts	Passenger enquires (V)		Sun Visor (faulty, adjusting)	Inadequate Lane width	Sickness
Ticket machine (V)	Communicating with Transport Operations Centre (V)	Talking to passengers (V)		Adjusting seat	Road layout	Medication
Mobile phone (V)	Keeping to timetable	Unruly passengers		Adjusting seatbelt	Road signage	Inexperience
Personal entertainment devices	Reading route journal (V)	Elderly or Disabled passengers		Adjusting steering column		Eating Drinking
		School children		Operating climate controls		

Phase 3: Method



Risk assessment of bus driver exposure to distraction sources

- Ergonomic assessments of company buses
- Review of company procedures and policies on distraction
- Review of current Australian laws relating to distraction
- Review of current company incident data on driver distraction and its contribution to crashes and incidents
- Identifying demographic characteristics of company bus drivers
- A Human Error Identification analysis for bus operation

Phase 3: Human Error Identification



Task	Distraction	Description	Consequence	Remedial Measures
Use "hand over hand" or "push-pull" technique to maintain appropriate lane position	Physical	Driver fails to maintain appropriate position in lane	Bus may move into an unsafe position on the road or may come into conflict with other road users	- Lane departure warning system - Automatic lane keeping system
	Visual	Driver fails to maintain appropriate position in lane	Bus may move into an unsafe position on the road or may come into conflict with other road users	- Lane departure warning system - Automatic lane keeping system
	Mental	Driver fails to maintain appropriate position in lane	Bus may move into an unsafe position on the road or may come into conflict with other road users	- Lane departure warning system - Automatic lane keeping system
Listen for bus stopping alert	Physical			
	Visual			
	Mental	Driver fails to hear bus stopping alert	Driver does not stop at the next bus stop as the passenger requires	- Improved bus stopping alert (haptic driver feedback)

Conclusions



- Driver distraction is a significant problem among bus drivers
- Many of the distraction sources identified stem from the additional tasks that bus drivers are required to undertake

What Can Be Done?

- Company policy, rules, training
- Good ergonomic design
- Use of Intelligent Transport Systems
- Further research into role of distraction in crashes within this transport sector