Feasibility of Using Truck Position Data to Identify Accident Risk

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Background

Microlise Ltd record GPS position (along with other sensor outputs) for 40,000+ trucks in the UK, for fleet management purposes

Report locations of ‘harsh braking’ incidents above a threshold deceleration of about 10m/s/s for duration of >1s

Highway Authority road safety investigations can no longer rely on previous accident rates (which is a good thing; accident rates are falling)

Incidents of harsh braking may reflect accident risk

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Incidents and Accidents

Initial investigation found clusters of incidents at some roundabouts

Roundabout approaches (excluding mainline)

Three years of incidents (447)

Ten years of accidents (31)

Harsh braking incidents are much more common than accidents – so may be useful in site investigation if they reflect accident risk?

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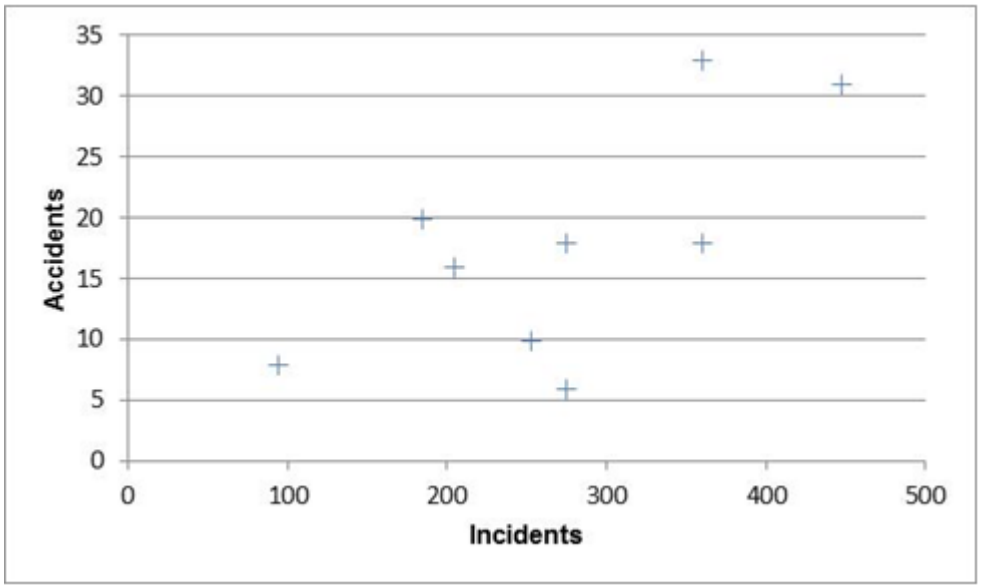
Incidents and Accidents

Relationship for nine roundabouts with high incident rates



Relatively weak relationship

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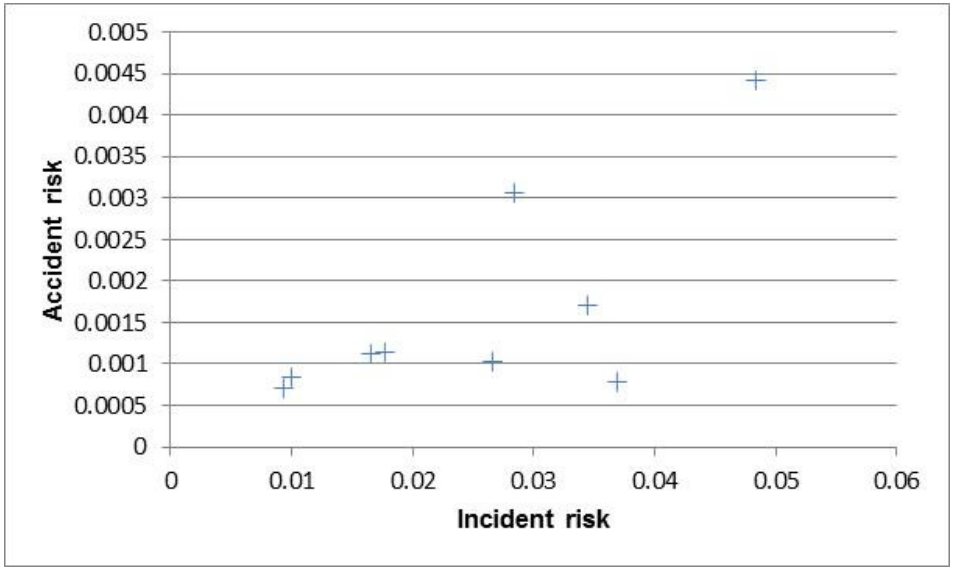
Incidents and Accidents

Relationship for nine roundabouts with high incident rates (normalised by truck traffic = risk)



Incident risk is ‘indicative’ of accident risk (all vehicles)

Could be used to help maintenance decisions.

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Next Steps

Estimate sight distances to better interpret impact of roundabout geometry

Investigate roundabouts with low levels of incidents

Investigate at route level, including mainline and other junctions

More data being generated on more trucks so will be possible to establish time series and benchmarks

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Other opportunities

Harsh cornering, in addition to braking

Buffering around incidents; consider trajectory during episode of increased accident risk

Comprehensive truck sensor capability with increasing uptake amongst truck fleets, including:

- steering wheel angle
- brake pressures and ABS (pre)activation
- axle loads

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Closing remarks

Crowd source data of these types are increasing, frequent and (potentially) low cost

Could be shared with Highway Authorities

Can provide additional information to engineering surveys and safety investigations

More closely related to driver experience and level-of-service.

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Conclusions

- Highway authority road safety investigations can no longer rely on previous accident risk
- Interpretation of truck position data provides information about potential ‘near misses’
- Incident risk is an indication of accident risk, so could be used as part of safety investigations
- Other vehicle data could provide a wider picture of safety risk.

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