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Car interactions in AUTOBUS

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AV shuttles interacting with cars

- Long-term video observations
- 2019 (February – October)
- Oslo and Kongsberg



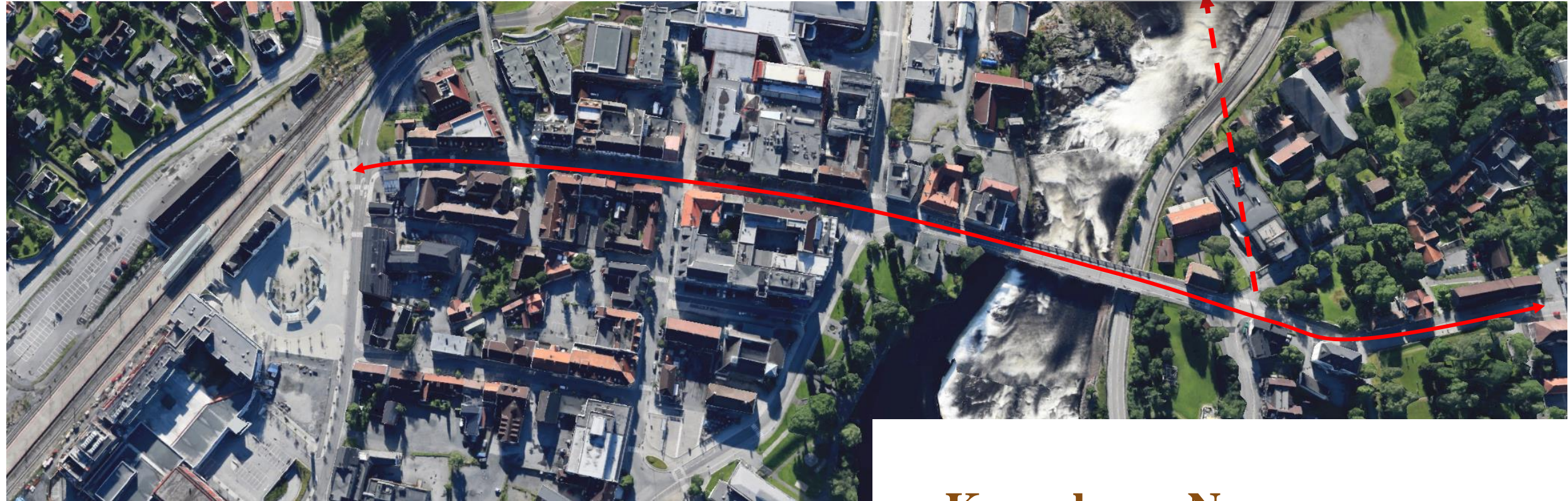
Research questions

How do ordinary cars react to the self-driving shuttles?

How do interactions **change over time**?



Oslo, Norway



Kongsberg, Norway

Video recordings

Month 2019	Days recorded		
	Site 1	Site 2	Site 3
February	15		
Mars	8		
April	10		
Maj	7	3	9
June	4	6	10
July			8
August			5
September	4		
October		7	7
Total	48	16	39



Site 1 - Kongsberg



Site 2 - Oslo



Site 3 - Oslo

Behavioural observations

Focus on how motor vehicle react to the shuttle, not on how the shuttle itself react

- Overtaking the shuttle
- Critical lag time

Overtaking the shuttle

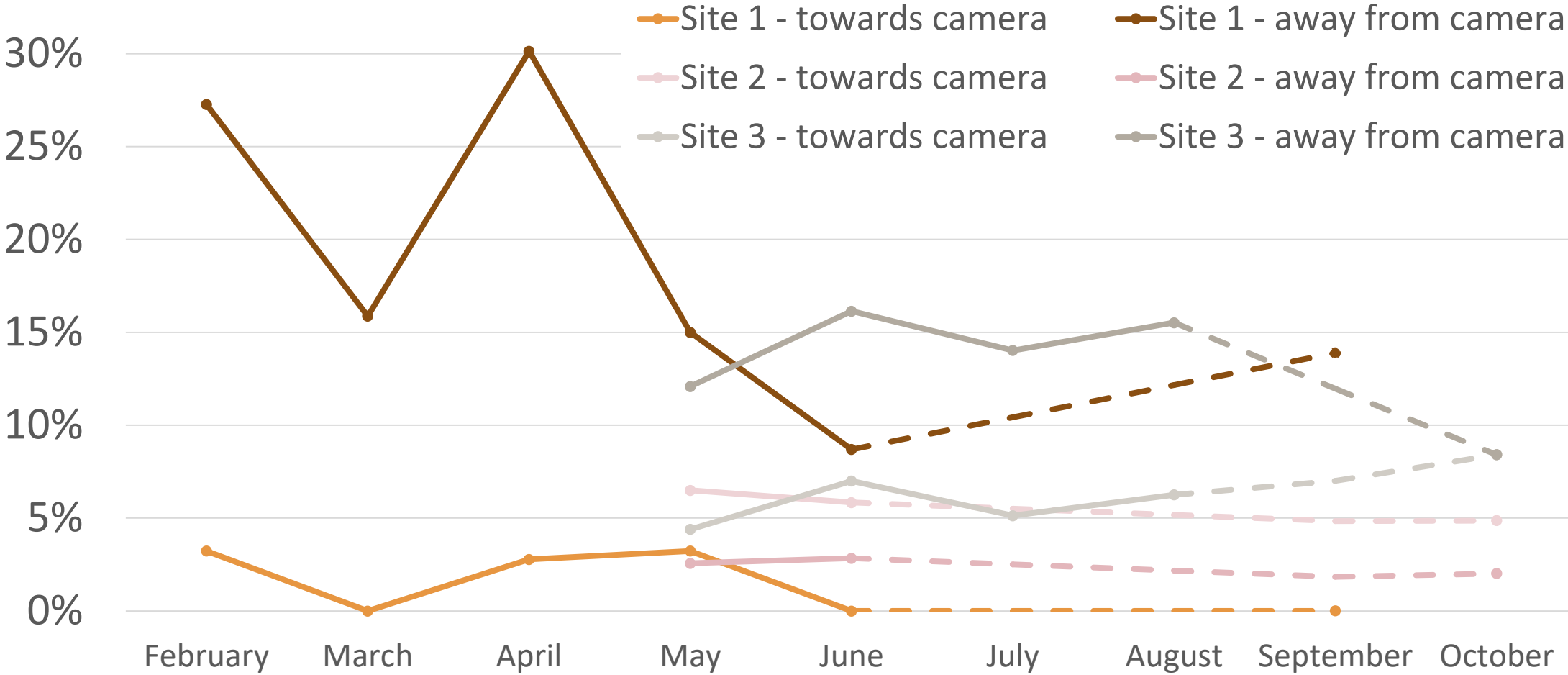


Overtaking the shuttle

Site and direction	Total number of passages	Number of passages with overtaking	Percentage of passages with overtaking
Site 1 Away from camera	343	72	21%
Site 1 Towards camera	341	7	2%
Site 2 Away from camera	368	9	2%
Site 2 Towards camera	358	20	6%
Site 3 Away from camera	949	130	14%
Site 3 Towards camera	929	56	6%
Total	3288	294	9%

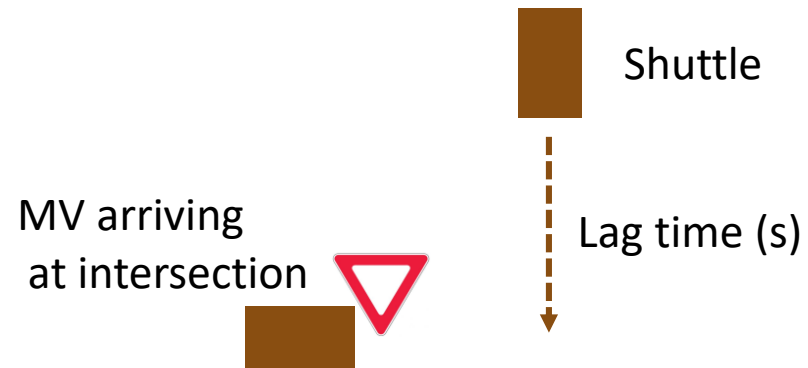
Overtaking's over time

Percentage of passages in which the shuttle was overtaken



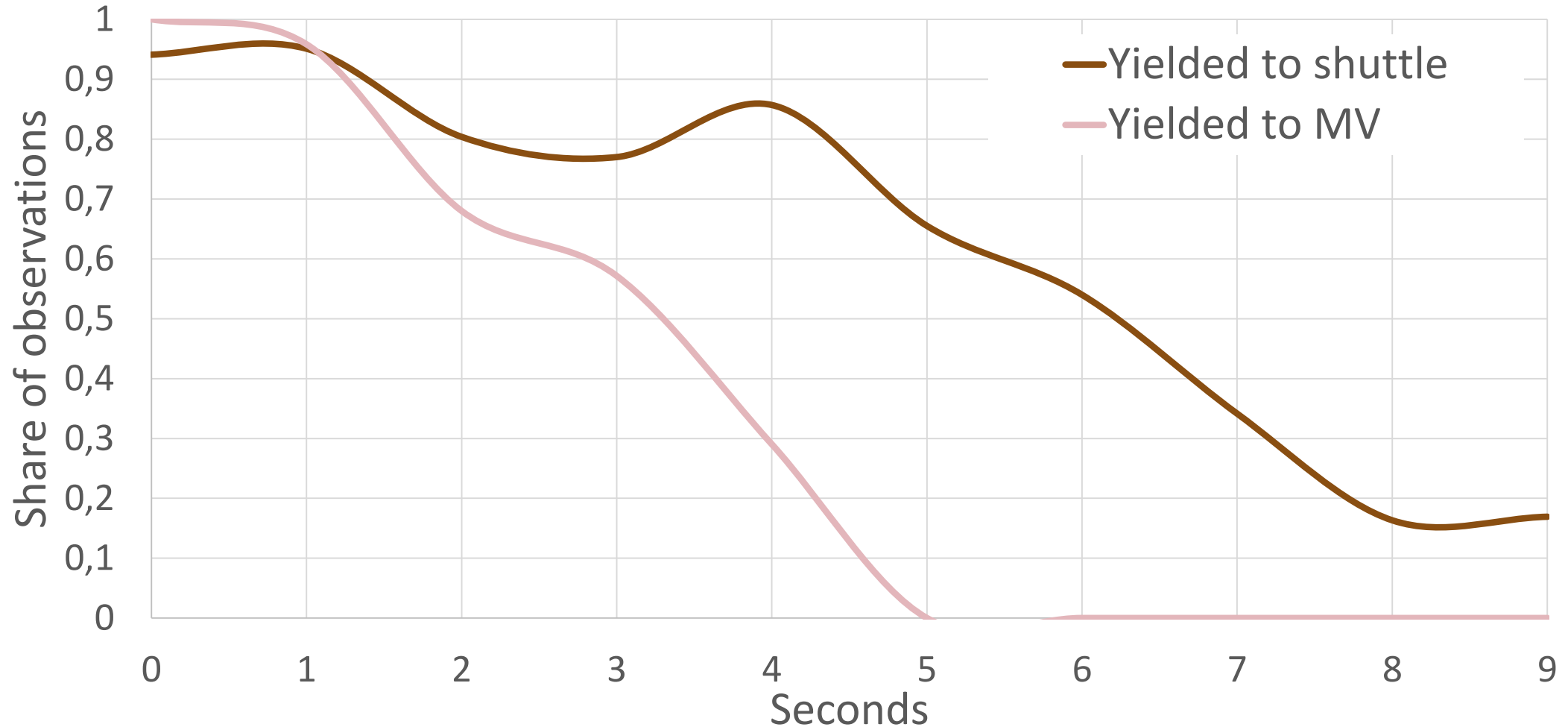
Critical lag time

When do motor vehicles yield to the shuttle?



Critical lag time

Share of events in which the MV yielded



Mean critical lag estimate

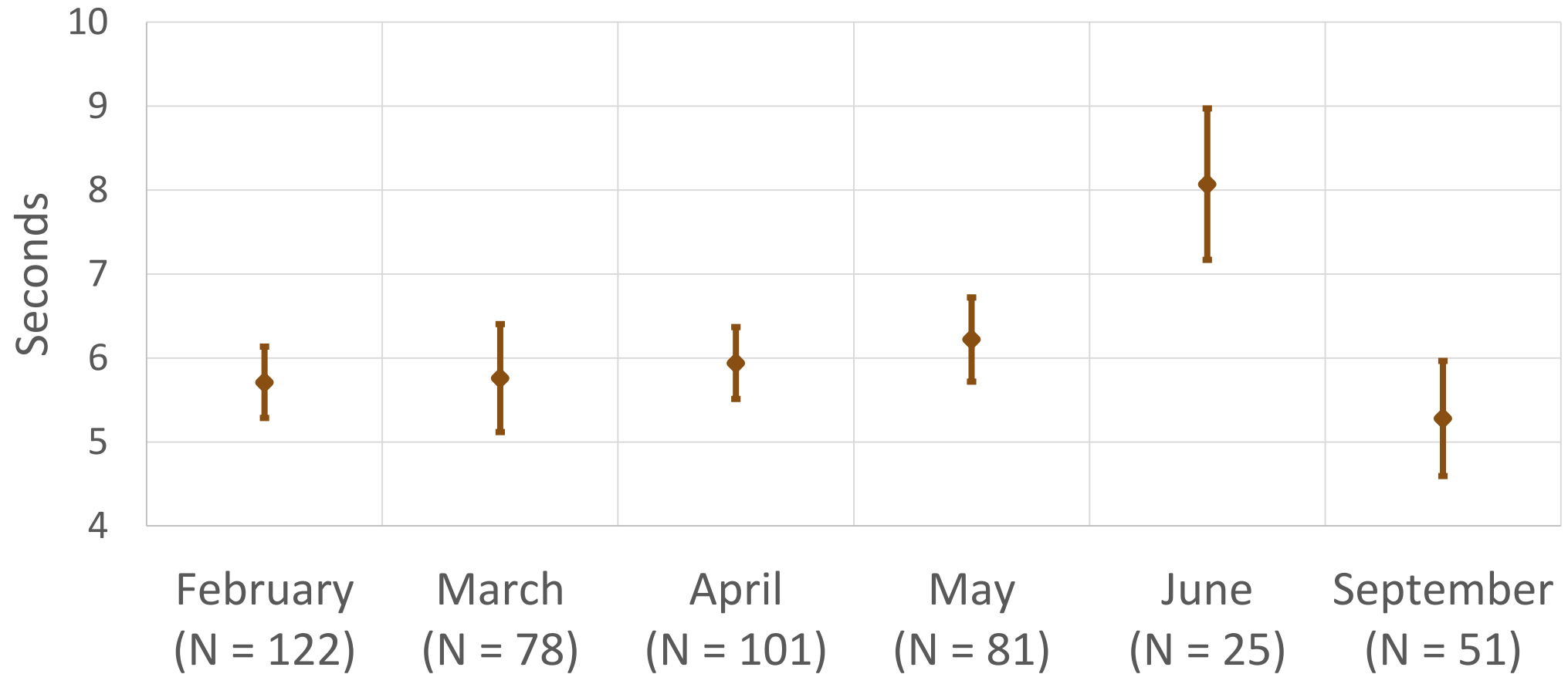
Shuttle = 6.1 s (2.7) | N = 458

MV = 3.3 s (1.2) | N = 158

Critical lag time over time



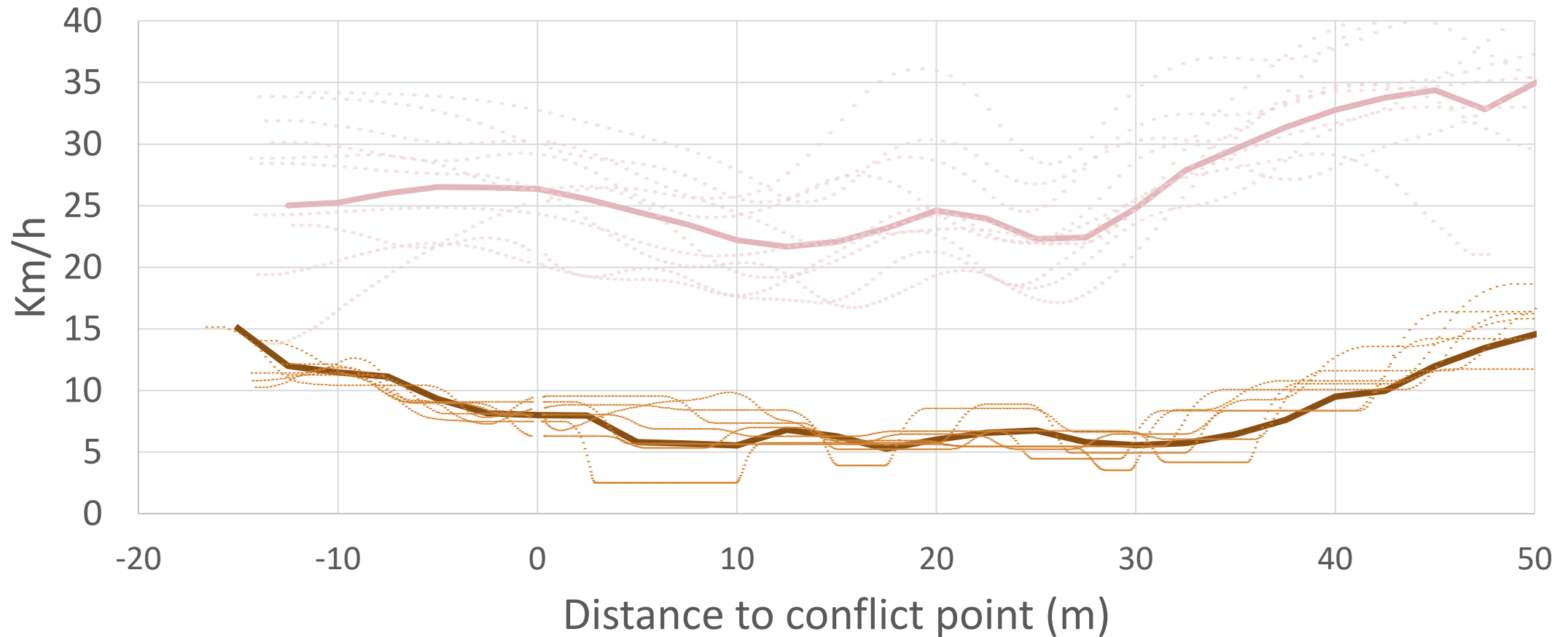
Mean critical lag interacting with the shuttle



Speed differences



Speed profile, towards camera



— Shuttle - mean profile — MV - mean profile · Shuttle - all data (n = 6) · MV - all data (n = 10)

Conclusions

- The low speed of the buses creates many overtaking's
 - this might create safety issue caused by the secondary interactions if the infrastructure does not allow for safe overtaking's.
- There is no indication that people became more aggressive towards the shuttle over time.



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