

Yielding behavior and traffic conflicts at crossing facilities at channelized right-turn lanes

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OBJECTIVE

Examine yielding behavior and safety issues between cyclists and motorists at crossing facilities at channelized right-turn lanes (CRTLs).

BACKGROUND

CRTLs generally

- ✓ Improve traffic flow efficiency
- ✓ Avoid 'unnecessary' stopping for motorists
- ✓ Include pedestrian and cyclist crossings

Limited number of studies:

- Mainly focused on motorized traffic
- Mostly compared right-turn treatments
- Primarily used crash data analyses

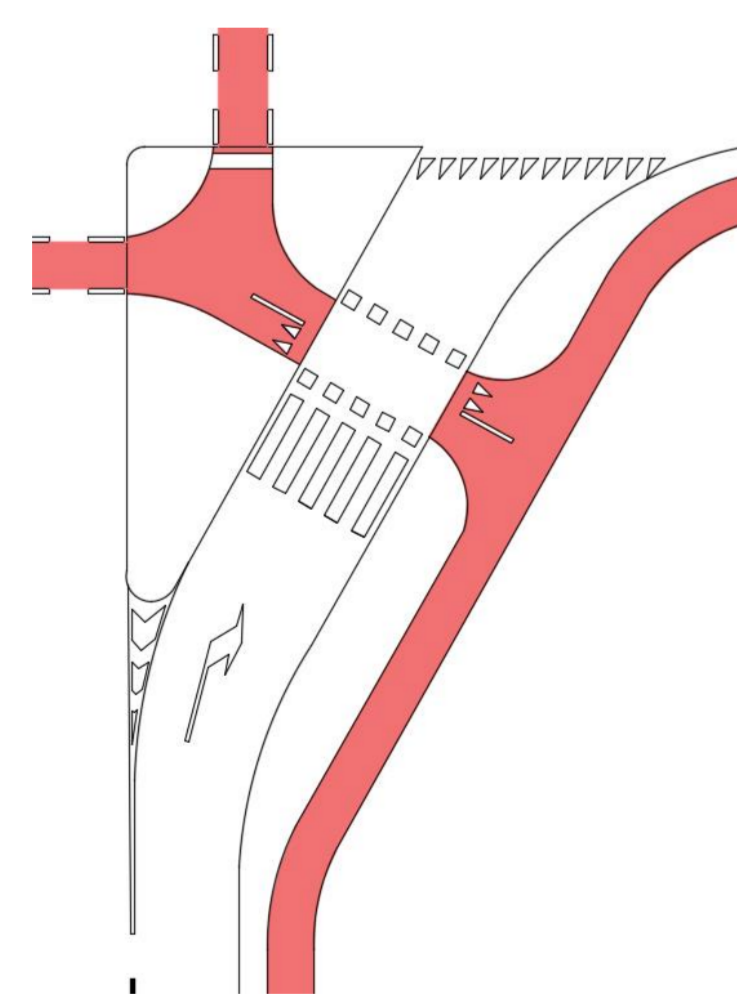
Suggested threats to cyclists' safety:

- Drivers focus on finding a sufficient merging gap
- "Looked-but-failed-to-see" errors
- Drivers blocking the crossing facility
- Drivers' might not expect cyclists arriving from the right-hand side

FLANDERS (BELGIUM)

Several types of CRTL design:

- **Bidirectional cyclist crossing** facilities at center of turning lane (most common);



Issues:

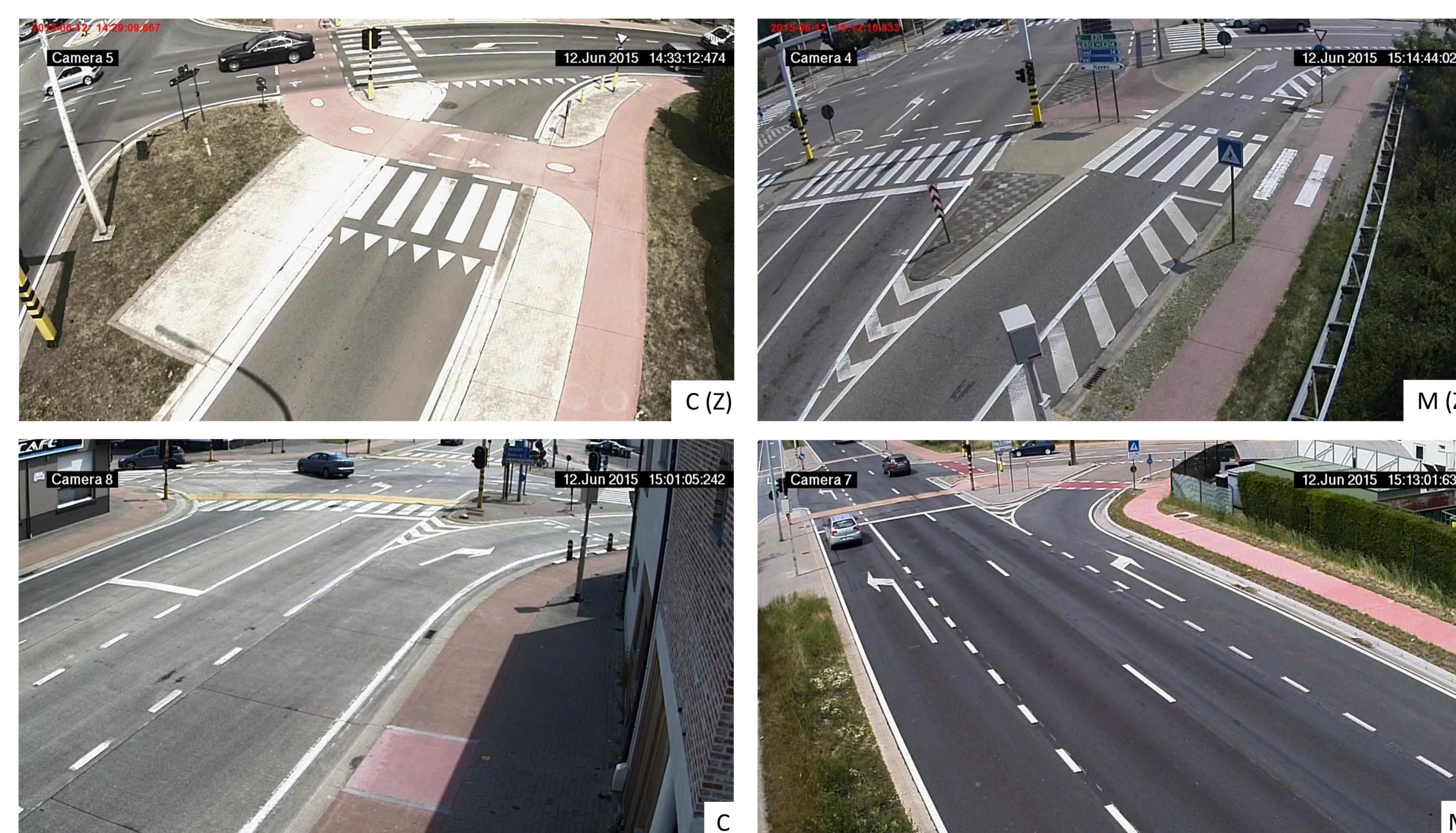
- **No strict rules or regulations** describing use of **priority rules** for road authorities
- No uniformity in design and consistency in priority rules

METHODOLOGY

- Observation of yielding behavior
 - Interactions between cyclists and motorists
 - Identification of four crossing behaviors:

Priority ruling adhered to?	Crossing style	
	Offensive	Defensive
Yes	Taking	Getting
No	Forcing	Receiving

- Traffic conflict observations
 - TTC_{min} (< 1.50 seconds)
 - STCT: TA severity level (24 and higher)
 - Semi-automated video analysis software (T-Analyst)



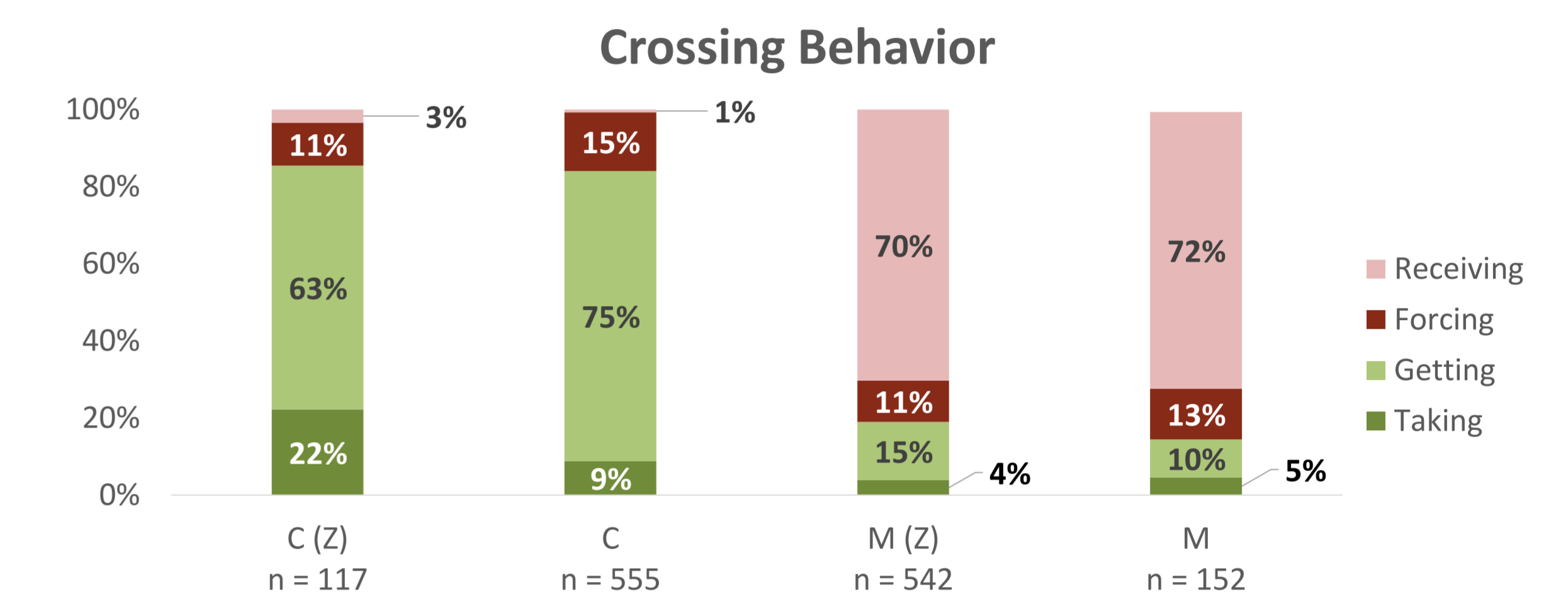
One week on-site video observations at four locations during daylight hours (06:00 – 21:00), two cameras per location

MAIN FINDINGS

Yielding behavior

No influence of priority rule on crossing order

- **Cyclists cross first in >80%** of the interactions
- Cyclists use a defensive crossing style

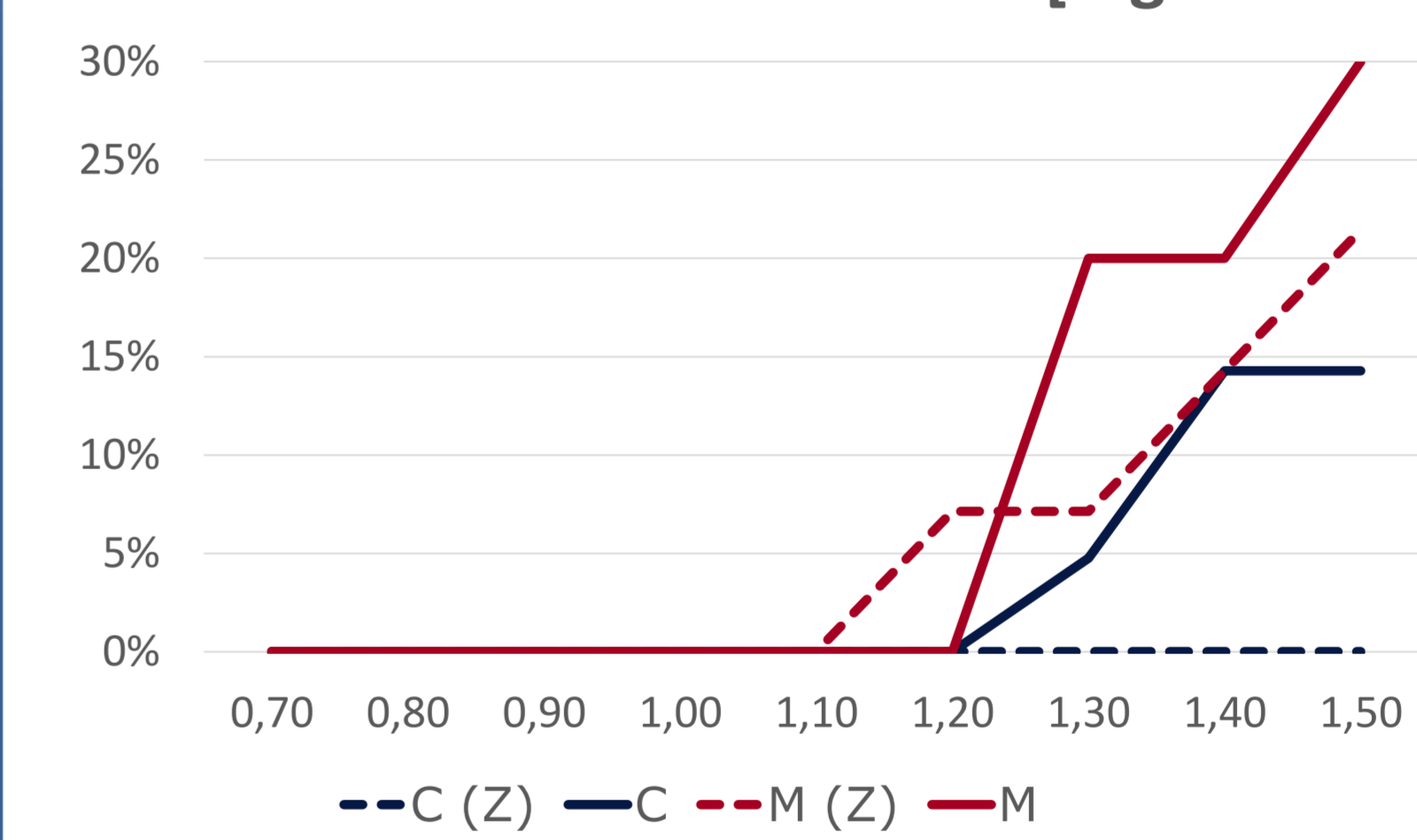


Cyclists' safety

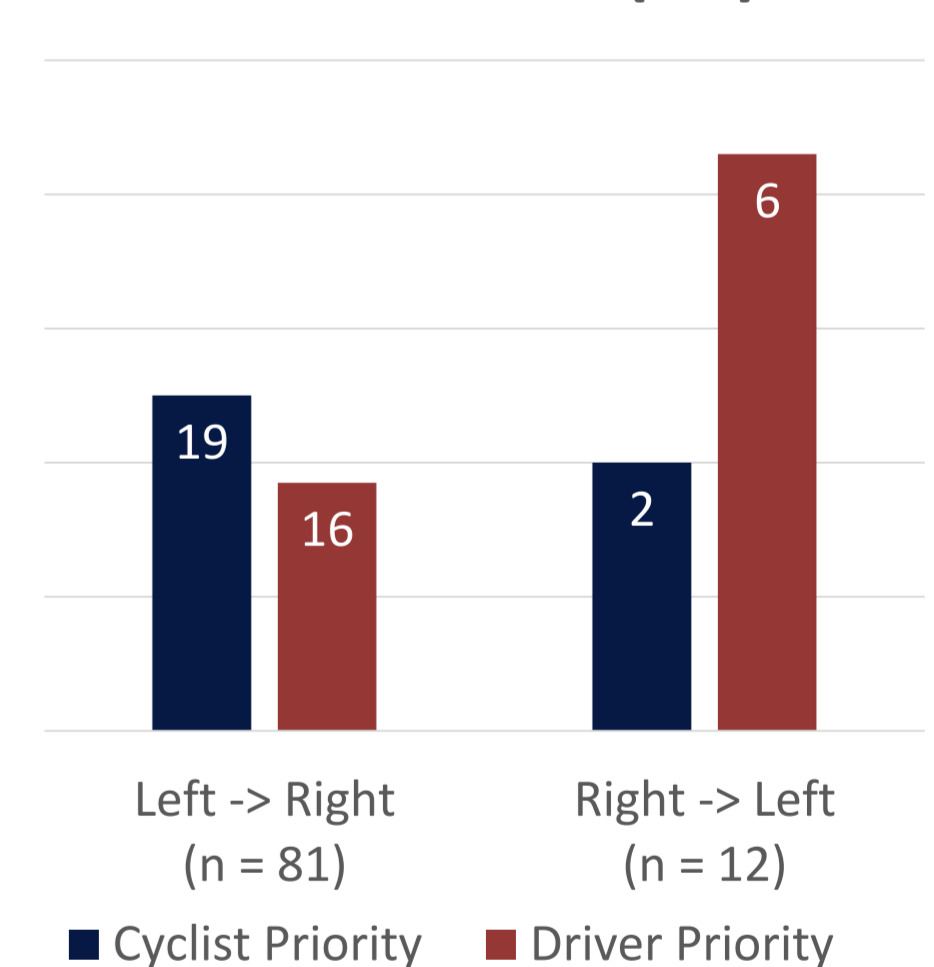
No significant effect of the priority rule found

- However, **higher proportions of serious conflicts** at locations with motorist priority and cyclists crossing from right to left **for both indicators**

Cumulative distribution TTC_{min} [Right -> Left]



Severe conflicts (TA)



CONCLUSIONS & DISCUSSION

- **Independent** of the **priority rule** at hand, **cyclists cross first** in most cases
 - Consistent with a previous study examining cyclist crossing facilities at roundabouts
- **Motorists willingly give away their right-of-way** to cyclists (85%)
 - Informal traffic rule, courtesy or fear of inflicting injuries to vulnerable road users?
 - Dangerous in cases where cyclists incorrectly anticipate to receive the right-of-way
- No significant effect of the priority rule on cyclists' safety was found
 - Higher proportions of serious conflicts for cyclists crossing from right to left at locations with motorist priority

RECOMMENDATIONS

Future Research

- Larger datasets
- Crossing behavior definitions
- Other cyclist crossing facility types
- Automated video-analysis software

Policy implications

- Uniformity in design
- Consistency in priority rules