

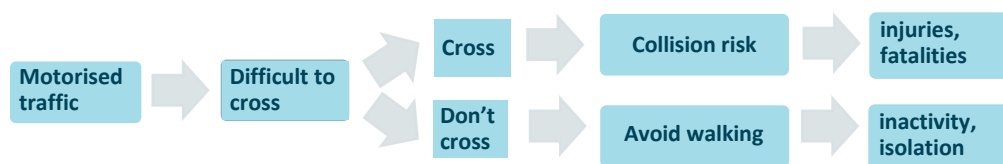
Minor roads can also be difficult to cross Can we rely on driver courtesy?

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Roads are barriers to health



Minor roads are barriers too

Lack of pedestrian infrastructure



Low traffic volume = high speeds



A common solution on minor roads: zebra (marked crosswalks)



Standard elements: stripes, signs, posts, markings

Legal requirement to stop

Poor safety record
(lack of driver compliance? pedestrians unwarranted sense of safety?)

Another solution: courtesy crossings

Drivers not legally required to stop for pedestrians but encouraged to do so by design elements

Stripes



Colours/textures



Visual narrowing



Ramps



Source of stripes and visual narrowing photos: CIHT (2018)

Courtesy crossings are controversial

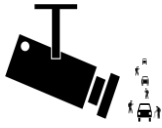
- Some reports that drivers and pedestrians feel confused
- Little evidence on how these crossings address movement and safety of pedestrians
- No guidance on where to provide and how to design these crossings.
Guidance from UK Dept. Transport withdrawn in 2018, seeking more research

Questions answered in this presentation

What are the factors that encourage drivers to stop for pedestrians at courtesy crossings?

Which design elements are more effective?

Data



937 interactions between drivers and pedestrians at 23 crossings in England (with various combinations of courtesy design elements)

One possible interaction for each separate traffic lane pedestrians cross

Variables

Design elements

Stripes
Colours/textures
Visual narrowing
Ramps

Crossing stage

From median strip to footway, From footway to median strip, or From footway to footway
First Lane, Second Lane, or Second Lane (opposite direction)

Pedestrian situation

Single pedestrian/group
No others, Others crossing ahead, or Others crossing from opposite side

Pedestrian characteristics

Gender
Age (child, younger adult, older adult)
Mobility restrictions

Vehicle situation/characteristics

Followed by another vehicle
Large vehicle (HGV/bus)

Infrastructure characteristics

Link, Junction (inbound), or Junction (outbound)
Speed limit
Raised kerb or not

Site characteristics

Shops or not

Time/day

Peak or not peak
Weekday or Saturday

Average courtesy rates, by type of crossing

Zebra	Courtesy crossing design elements				Number of crossings	% interactions where first vehicle stops	% interactions where any vehicle stops
	Stripes (not zebra)	Colours/textures	Visual narrowing	Ramps			
		x			2	4	4
			x		1	20	42
		x	x		4	54	54
		x	x	x	3	67	78
				x	1	76	92
		x		x	3	76	84
	x	x		x	4	78	88
x					3	88	96
	x	x			1	95	95
	x		x		1	97	99
Whole sample					23	73	81

Courtesy rates, by other characteristics

		First vehicle stops (%)	Any vehicle stops (%)
		%	%
Crossing stage	From median strip to footway	80	90
	From footway to median strip	79	89
	From footway to footway	66	74
Pedestrian situation	No others	64	74
	Others crossing ahead	84	87
	Others crossing from opposite side	85	88
Vehicle situation	Followed by another vehicle	79	88
	Not followed	59	66
Vehicle characteristics	Small vehicle (Car/motorcycle)	70	78
	Large vehicle (HGV/bus)	42	50
Site characteristics	Shops along footway	75	83
	No shops	64	72
Day	Weekday	67	74
	Saturday	77	87
	All	69	77

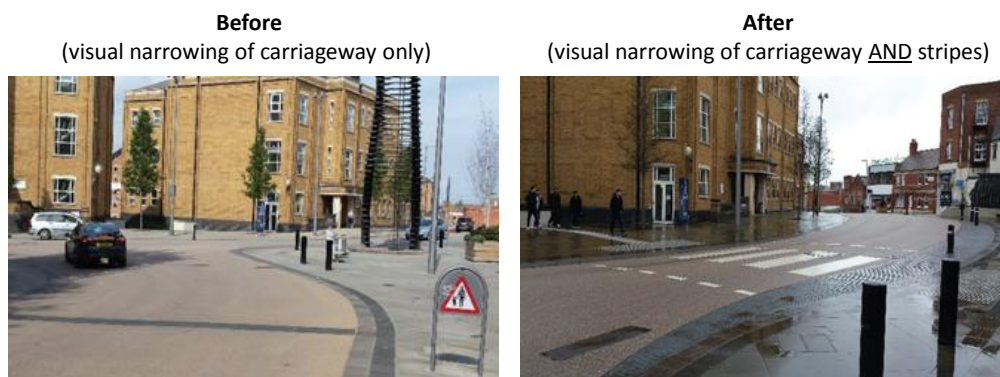
Insignificant differences: first lane vs. second lane, single pedestrian vs. group, gender, age, mobility restrictions, link vs. junction, speed limit, raised kerb

Model results

Variable		First vehicle stops	Any vehicle stops
<i>Constant</i>		-4.31	-9.04
Design elements	Stripes (not zebra-like)	1.68	1.80
	Colours/textures	1.35	1.11
	Visual narrowing of carriageway	1.38	3.00
	Ramps	1.47	2.21
Crossing stage	From median strip to footway	2.29	5.14
	From footway to median strip	1.36	4.60
	Second lane	0.67	
Pedestrian situation	Group	0.58	
	Others crossing ahead	1.39	0.63
	Others crossing from other side	1.96	1.39
Pedestrian characteristics	At least one woman		0.83
Vehicle situation	Followed by another vehicle	0.69	1.41
Other infrastructure Characteristics	Junction, inbound traffic	-1.29	
	Junction, outbound traffic	-1.37	
	Speed limit=20mph	1.14	4.31
Site characteristics	Shops	0.90	2.40

Insignificant variables: age, mobility restrictions, large vehicle, raised kerb, time, day

Before-after analysis



Photos: CIHT (2018)

Courtesy rates: before and after

Variable	% first vehicle stops		% any vehicle stops	
	Before	After	Before	After
<i>Crossing stage</i>				
First Lane	16	96	39	99
Second Lane (in opposite direction)	24	98	44	100
<i>Pedestrian situation</i>				
Single pedestrian	22	99	38	100
Group	19	95	44	99
No others	16	94	38	99
Others crossing ahead	33	100	67	100
Others crossing from opposite side	35	100	53	100
<i>Pedestrian characteristics</i>				
At least one woman	22	95	48	99
No women	17	99	28	100
All	20	97	42	99

Conclusions

- All four design elements (stripes, colours/textures, visual narrowing, ramps) significantly increase courtesy rates
- Some of the other factors increasing courtesy rates have also been found in previous literature to increase propensity to stop at zebras, e.g. crossing from/to median strip, lower speed limit
- Weak/no evidence that courtesy behaviour is related to characteristics of pedestrians (age, gender, mobility restrictions)

Implications

Design of courtesy crossings should include all four design elements considered

If possible, in combination with median strips and lower speed limits

Thank you for your attention!

Further information:

Anciaes, P., Di Guardo, G., Jones, P. (2020) Factors explaining driver yielding behaviour towards pedestrians at courtesy crossings.

Transportation Research F: Traffic Psychology and Behaviour **73**, 453-469

<https://iris.ucl.ac.uk/iris/browse/profile?upi=PRANC25>