

APRIL 2017

Video monitoring of cycle track bus boarders

Summary of monitoring
outputs from three bus
stops on Blackhorse
Road, Waltham Forest



EVERY JOURNEY MATTERS

Background: cycle track / bus boarders

A type of bus stop where a cycle lane or track continues between the bus stop cage and the waiting area on the footway for passengers.

To board or alight from the bus, people step over the cycle track, which is at the same level as the footway through the bus stop area. Bus passengers either step directly into the cycle track, or onto a buffer zone between the bus stop cage and the cycle track.

Research questions : In what contexts can such infrastructure reliably be used without compromising pedestrian and bus passenger comfort? Does cyclist behaviour give us confidence that there is minimal risk to bus users?



CTBB in Royal College Street, Camden



CTBB in Green Lanes, Enfield – with buffer for people alighting from the bus



Bus boarders

Figure 15: Full-width boarder

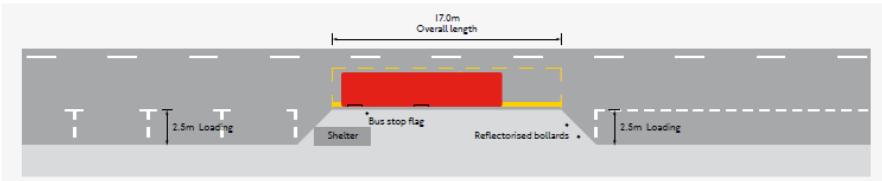


Figure 16: Alternative full-width boarder layouts

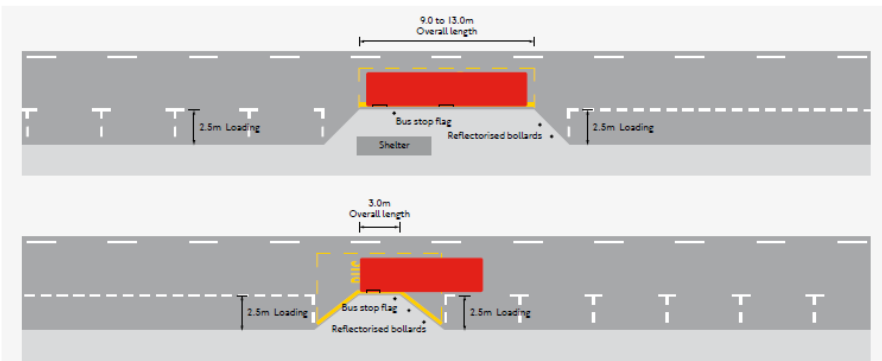
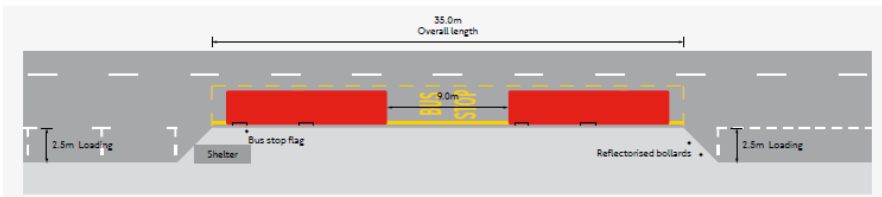


Figure 17: Multiple bus full-width boarder



Note that, to avoid confusion, cycle tracks through bus stops should not be referred to as 'bus boarders'.

The term 'bus boarder' has an established meaning as a build-out from the kerb-line at a bus stop to aid boarding, typically where there are loading or parking bays before and after the bus stop. TfL's Accessible Bus Stop Design Guide shows different bus boarder layouts (left).

We are using the term 'cycle track / bus boarder' because the part of the cycle track that runs through the bus stop area, and is shared with bus passengers, effectively acts like a boarder when a bus is at the stop.



Data from Royal College Street, Camden

Video footage from Urban Movement and LB Camden that allowed partial view of one bus stop with a CTBB (rear doors, passengers alighting) was analysed by TfL ODE in 2016. Interactions between cyclists and bus passengers were recorded.

Date: 20/09/14, 7-10am and 4-7pm (6 hours in total)

Count of bus passengers alighting	39
Count of cycles while a bus is in the stop	31
No. of cyclists slowing/stopping	7
No. of interactions noted	4



In 2 of those 4 interactions, the cycle swerved around the pedestrian without either stopping. In the other two, one, the other or both stopped.

This data gives some indication that:

- Most cycles pass through without incident when the bus is in the stop
- Interactions are low-level, and involve satisfactory negotiation

Bus passenger numbers are very low here. Evidence from busier sites is needed.



Monitoring of Blackhorse Road bus stops

Objectives:

- To observe and classify the rate and type of interactions between cyclists and pedestrians at three bus stops with cycle track / bus boarders in Waltham Forest
- To compare bus stops with different bus passenger numbers

Methodology:

- Video monitoring, 3 days (6-8 Dec 2016), 7am to 7 pm, by Intelligent Data
- Data counts (in 15 min intervals)
 - Pedestrian flows – passing, boarding, alighting
 - Cycle flows – cycle track, footway, carriageway
- Record of pedestrian / cyclist interactions (by type and time stamp)

Site-specific considerations:

- On this link, the cycle track is of the same colour and material as the footway, and is at the same level, so there is no ramping up at the bus stop.
- Two of the sites are busy with bus passengers interchanging with tube/rail
- The footway is noticeably narrower at one of the three sites (site 1)



Site 1:

BB (Blackhorse Road station, southbound)

Routes 158, 230

Bus frequency: 12 per hour



Site 2

BA (Blackhorse Road station, northbound)

Routes 158, 230

Bus frequency: 12 per hour



Site 3

BM (Waltham Forest College, northbound)

Route 158

Bus frequency: 6 per hour



Cycle, pedestrian and bus user counts

Recorded flows over three 12-hour days	1. Blackhorse Road station (southbound)			2. Blackhorse Road station (northbound)			3. Waltham Forest College		
	total no.	per hour equiv.	%	total no.	per hour equiv.	%	total no.	per hour equiv.	%

All pedestrians	7,800	217		24,641	684		4,260	118	
Boarding a bus	3,162	88	41%	3,125	87	13%	300	8	7%
Alighting from a bus	873	24	11%	3,834	107	16%	1,461	41	34%
Waiting or passing through	3,765	105	48%	17,682	491	72%	2,499	69	59%

All cyclists	593	16		625	17		205	6	
Using cycle track	336	9	57%	499	14	80%	197	5	96%
Using footway	8	0	1%	10	0	2%	1	0	0%
Using carriageway	249	7	42%	116	3	19%	7	0	3%



Number and rate of interactions

- How many interactions between pedestrians and cyclists were recorded?
- What is the rate by pedestrian number (ie interactions divided by ped count)?

Site 1		Site 2		Site 3	
No.	Rate	No.	Rate	No.	Rate

All pedestrians	114		120		8	
Boarding a bus	21	1 / 150	15	1 / 208	0	-
Alighting from a bus	2	1 / 437	17	1 / 226	0	-
Waiting or passing through	91	1 / 42	88	1 / 201	8	1 / 313

Cyclists using cycle track	114	1 / 3	120	1 / 4	8	1 / 25
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- Most interactions are with people walking through or waiting at the bus stop – 187 out of 242 recorded interactions (80% at site 1, 73% at site 2 and 100% at site 3)
- Those waiting at or walking through at site 1 were by far the most likely to have an interaction with a cycle
- Cyclists are very likely to encounter a pedestrian or bus passenger, especially at sites 1 and 2



Levels of interaction

Interaction type	SITES			TOTAL
	1	2	3	
Boarding a bus				
1 – precautionary	12	8	0	20
2 – controlled	9	7	0	16
3 – near miss	0	0	0	0
Alighting from a bus				
1 – precautionary	0	11	0	11
2 – controlled	1	6	0	7
3 – near miss	1	0	0	1
Waiting or passing through				
1 – precautionary	78	74	5	157
2 – controlled	10	13	2	25
3 – near miss	3	1	1	5

Of 242 interactions, 6 were near misses and 48 involved controlled action

key

Level 1: Precautionary – for example stopping to allow the other road user to pass

Level 2: Controlled – minor deviation from initial route, or controlled braking

Level 3: Near Miss – rapid deceleration, lane change or stopping

No level 4 (Very Near Miss) or level 5 (Collision) interactions were observed



A closer look at level 2 and 3 interactions

The 48no. Level 2 interactions:

The cyclist diverted and/or slowed in all of the 16 involving bus passengers boarding and the 7 involving passengers alighting.

Of the 25 involving pedestrians waiting or walking, the cyclist slowed or diverted in 22. A pedestrian slowed or diverted in 2. In the other, both slowed and diverted.

In 5 instances, the cyclist was going the wrong way on the track.

In 3 instances, the cyclist diverted to the carriageway to get past.

The 6no. Level 3 interactions :

1. Boarding bus passenger jumps on to pavement last minute
2. Cyclist travelling too fast slows last minute. Pedestrian does not give way, so cyclist has to swerve.
3. Pedestrian oblivious of cyclist - semi near miss
4. Cyclist going wrong way down cycle track, squeezes past two peds facing the other way. Near miss
5. Cyclist stops last minute then diverts around ped
6. Cyclist travelling fast diverts to carriageway to avoid peds on cycle track

- Some evidence of poor cycling behaviour leading to interaction
- The cyclist took evasive action in the 5 cases involving a pedestrian waiting or walking through
- One instance of a passenger boarding who has to take evasive action because of a cyclist



Who gives way?

	SITES			TOTAL
	1	2	3	
Number of interactions in which:				
Cyclist gives way	15	45	0	60
Cyclist stops completely	7	9	0	16
Cyclist slows	8	36	0	44
Pedestrian or bus passenger gives way	74	41	5	120
Both or neither clearly gives way	25	34	3	57
Breakdown by percentage of all interactions				
Cyclist	13%	38%	-	25%
Pedestrian or bus passenger	65%	34%	63%	50%
Not determined	22%	28%	38%	24%

- Bus passengers give way twice as often as cyclists overall
- Cyclists are significantly more likely to give way at site 2



Summary of findings

- Few pedestrian/cycle interactions involve people getting on or off buses at these sites
- Where interactions with bus passengers occur, around two-thirds (logged as level 1 interactions) involve the bus passenger giving way to the cyclist
- Where a level 2 or 3 interaction occurred, it was the cyclist who took action in all but one instance (23 out of 24)
- Cyclists were far more likely to give way at site 2, the busiest bus stop overall, and the one with by far the most bus passengers alighting (38% of cyclists and 34% of bus passengers gave way at site 2, compared with 13% and 65% respectively at site 1)
- 77% of all interactions occurred with people waiting at the bus stop or walking through
- Of the level 2 or 3 interactions, the cyclist took action in 28 out of 30 instances
- Site 1 experiences the highest rates of interaction with people waiting or walking through – this has the narrowest footway and waiting area of all the sites
- Site 1 has a high proportion of cyclists choosing to use the carriageway rather than cycle track (42%, compared with 19% at site 2 and 3% at site 3). There were several instances of cyclists having to divert onto the carriageway to avoid people in the cycle track at site 1
- Site 3 has a very low cycle flow. Zero interactions were recorded with bus passengers

