Table S1. Definitions of built environment variables collected at road traffic crash hotspots

📖 Data Dictionary Codebook

09/22/2015 10:27pm

#	Variable / Field Name	Field Label *Field Note*	Field Attributes (Field Type, Validation, Choices, Branching Logic, Calculations, etc.)
Instrument: **Bea**			
1	participant_id	Participant ID	text
2	road_area	Type the letter on the map that shows the point where you are collecting data.	text
3	road_urban	What kind of area is the road/point in? *Choose rural if you think there are very few vehicles, people, and buildings surrounding the point. Choose urban If at the point you feel like you are in a city surrounded by people, vehicles, and buildings.*	radio 0, Rural 1, Urban 99, Unknown
4	intersections	Is this point at an intersection/junction? *Choose yes if this point exists at a junction or intersection of roads, choose no if it is on a road running straight through. A junction is defined by at least two roads coming together. A single road with two directions of traffic does not have a junction even if there is a traffic light or stop sign.*	radio 0, No 1, Yes 99, Unknown
5	compass Show the field ONLY if: [intersections] = '1'	Open the compass app on your tablet and use it to find the direction North. The road that passes through the direction North should be called A. Turn clockwise and the next road you come to should be B, then C, then D, and so on.	descriptive
6	intersect_count Show the field ONLY if: [intersections] = '1'	How many roads go through this junction? *Some examples; Peage is a junction of 2 roads, the wedding rondpoint is a junction of 4 roads, Gishushu/RDB is a junction of 2 roads.*	radio 1, 2 - T junction 2, 2 - cross junction 3, 3

			4 | 4 5 | 5 6 | 6 99 | Unknown
7	aroad_design Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Design of Roadway a *Choose highway only if the road has no humps and no traffic lights or stop signs. Large roads in Kigali are Arterials (the road from town to sonatube, from sopetrade to ministry of defense, poids lourd road are all arterials). Collector streets lead to arterials and will be paved. Local streets can be paved or dirt but will never connect directly with an arterial street.*	radio 0 | Highway 1 | Arterial Street 2 | Collector Street 3 | Local Street 99 | Unknown
8	alane_type Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Number of lanes in road a *Count the number of traffic lanes not including lanes meant only for turns or passing -*	radio 0 | 1 lane (single direction of traffic) 1 | 2 lanes (two directions of traffic) 2 | 4 lanes (2 lanes for each direction of traffic) 3 | More then 4 lanes 99 | Unknown
9	aauxiliary_lane Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Auxiliary Lanes of road a *Answer yes if you see a lane especially for turning or passing.*	radio 0 | No 1 | Yes 99 | Unknown
10	apavement Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Road a Paved? *From where you are standing look down the road in all directions and note the surface of the road - paved or dirt*	radio 0 | Dirt road 1 | Partially paved 2 | Fully paved 99 | Unknown
11	ard_condition Show the field ONLY if: [intersections] = '0' or [intersect_coun	Road a Surface Conditions? *Select all that apply*	checkbox 0 | ard_condition___0 | Dry

	t] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'		1 ard_condition___1 Wet 2 ard_condition___2 Flooded with water 3 ard_condition___3 Slippery surface (oil, mud, garbage, leaves) 4 ard_condition___4 holes 90 ard_condition___90 Others 99 ard_condition___99 Unknown
12	ard_marks Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Markings on road a *Select all that apply*	checkbox 0 ard_marks___0 No markings 1 ard_marks___1 black and white painted edges 2 ard_marks___2 lane dividers painted on road 3 ard_marks___3 turning lanes marked on road 4 ard_marks___4 reflectors on road edges 5 ard_marks___5 reflectors down road center 6 ard_marks___6 unpainted roadside bricks 90 ard_marks___90 other traffic markings on road 99 ard_marks___99 unknown
13	apolice Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Police presence on road a *Select all that apply*	checkbox 0 apolice___0 No police 1 apolice___1 1 officer monitoring area 2 apolice___2 2 officers monitoring area 3 apolice___3 officers directing traffic 90 apolice___90 other 99 apolice___99 unknown
14	aconflict_intersections Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_cou	Traffic slowing on road a *Describe this for each road that you evaluate that is part of a junction. Watch the traffic and road options to determine if traffic must slow down to perform movements. Some examples; rondpoints have slowing of traffic due to merging, cross junctions have slowing from turns*	checkbox 0 aconflict_intersections___0 No reason for traffic slowing 1 aconflict_intersections___1 due to left turns 2 aconflict_intersections___2 due to right turns

	nt] = '6' or [intersect_count] = '99'		3 aconflict_intersections___3 due to pedestrians crossing the road 4 aconflict_intersections___4 due to pedestrians on side of road 5 aconflict_intersections___5 due to traffic merging in 99 aconflict_intersections___99 Unknown
15	aroad_narrow Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Narrowing of Road a *Select all that apply*	checkbox 0 aroad_narrow___0 No narrowing 1 aroad_narrow___1 Yes - due to erosion 2 aroad_narrow___2 Yes - due to Landslides 3 aroad_narrow___3 Yes - due to new construction 4 aroad_narrow___4 Yes - due to pedestrians walking on road 5 aroad_narrow___5 Yes - due to parked cars 99 aroad_narrow___99 Unknown
16	aroadside Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Presence of Roadside (shoulder) on a *Not a true lane of traffic but some extra space along the side of the road*	radio 0 No 1 Yes 99 Unknown
17	aunevenness_roadside Show the field ONLY if: [intersections] = '0' or [aroadside] = '1' and [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Unevenness of roadside (shoulder) on a *Choose yes if you think that the shoulder has a slope to it causing it to be uneven, or if it appears there are many dips and hills.*	radio 0 No 1 Yes 2 Not applicable 99 Unknown
18	aunevenness_medians Show the field ONLY if: [inters	Unevenness of median of a divided road a *An example, the median of grass and trees on the road from town to*	radio

	ections] = '0' or [alane_type] = '2' or [alane_type] = '3' or [alane_type] = '99' and [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	*CHUK is NOT uneven, look for sloping or holes again*	0 No 1 Yes 2 Not applicable 99 Unknown
19	awalkways Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Presence of sidewalks on road a *Dedicated pedestrian only areas to walk that are separate from the road, like on both sides of the road from CHUK to town*	radio 0 No 1 Yes 99 Unknown
20	ainformal_walkways Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Presence of informal pedestrian walkways on road a *Do you see many pedestrians walking on the side of the road? An example is near the construction just past BK walking from BK towards the UTC - there is no sidewalk but many people walk in that area of the road*	radio 0 No 1 Yes 99 Unknown
21	aunderpasses Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Presence of a vehicle underpass on road a *An example, Poids Lourds passes under the road going to Kimicanga near kwa rasta*	radio 0 No 1 Yes 99 Unknown
22	abus_stop Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Presence of Bus Stop on road a	radio 0 No 1 Yes 99 Unknown

23	abump Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Presence of a hump on road a	radio 0, No 1, Yes 99, Unknown
24	abump_type Show the field ONLY if: [intersections] = '0' or [abump] = '1' and [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Type of hump on road a	radio 0, low and curved 1, high and curved 2, rumble strips 3, trapezoidal 4, Not applicable 90, other 99, Unknown
25	atraffic_light Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Presence of traffic light on road a	radio 0, No 1, Yes 99, Unknown
26	atraffic_light_extras Show the field ONLY if: [intersections] = '0' or [atraffic_light] = '1' and [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Presence of traffic light features on road a *Some lights show the number of seconds until the light changes*	checkbox 0, atraffic_light_extras___0, No - simple light 1, atraffic_light_extras___1, Yes - countdown timers 2, atraffic_light_extras___2, Yes - pedestrian signal 3, atraffic_light_extras___3, Yes - left turn signal 4, atraffic_light_extras___4, Yes - right turn signal 5, atraffic_light_extras___5, Not applicable 90, atraffic_light_extras___90, other 99, atraffic_light_extras___99, Unknown

27	aroad_signs_traffic Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Existence of traffic signs on road a	checkbox 0, aroad_signs_traffic___0, No 1, aroad_signs_traffic___1, Yes - Stop Signs 2, aroad_signs_traffic___2, Yes - other traffic signs 99, aroad_signs_traffic___99, Unknown
28	aspeed_limit Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Signs showing speed limit for cars on road a	dropdown 0, No speed limit posted 1, < =40 kmph 2, between 40-60 kmph 3, 61-80kmph 4, 80-110 kmph 5, >110 kmph 99, Unknown
29	acurves_type Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Types of curve on road a	checkbox 0, acurves_type___0, No curves 1, acurves_type___1, Horizontal 2, acurves_type___2, Vertical - hill 99, acurves_type___99, Unknown
30	ahorizontal_curve Show the field ONLY if: [intersections] = '0' or [acurves_type(1)] = '1' and [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Types of Horizontal Curve on road a	radio 0, Simple curve - 1 bend 1, Compound curve - 2 bends, S curve 2, circle curve - rondpoint 3, sharp simple curve - less then 90 degree angle 4, reverse curve - U turn 5, Not applicable 90, Others 99, Unknown
31	avertical_curve	Types of Vertical Curve on road a	radio

	Show the field ONLY if: [intersections] = '0' or [acurves_type(2)] = '1' and [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'		0 Sag curve - large dip in road 1 Summit curve - top of a hill 2 Not applicable 99 Unknown
32	abridges Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Presence of Bridges on road a	radio 0 No 1 Yes 99 Unknown
33	avisibility Show the field ONLY if: [intersections] = '0' or [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	Inadequate visibility on road a *Stand at the point you are evaluating and look down each road. If you notice that something is causing limited visibility you should estimate the number of car lengths between where you stand and the visibility problem occurs. Document this in the next question that pops up if you select one of the poor visibility options.*	checkbox 0 avisibility___0 No - good visibility 1 avisibility___1 Yes - blocked by Plants / tree 2 avisibility___2 Yes - blocked by a building 3 avisibility___3 Yes - limited by shape of road 99 avisibility___99 Unknown
34	avisibility_length Show the field ONLY if: [intersections] = '0' or [avisibility(1)] = '1' or [avisibility(2)] = '1' or [avisibility(3)] = '1' and [intersect_count] = '1' or [intersect_count] = '2' or [intersect_count] = '3' or [intersect_count] = '4' or [intersect_count] = '5' or [intersect_count] = '6' or [intersect_count] = '99'	How many car lengths until visibility is reduced on road a?	text

<table>
<tr><td>180</td><td>fpedestrians
Show the field ONLY if: [intersect_count] = '6' or [intersect_count] = '99'</td><td>Crossing of Pedestrians on road f
Mark all the things you see that are designed to make it safer for pedestrians to use the road that you are analyzing

Question number 180 content would be equivalent to analysis of a single road A number 35, each of the questions would be repeated for the total roads that enter a hotspot junction</td><td>checkbox<table><tr><td>0</td><td>fpedestrians___0</td><td>No pedestrian crossing tools</td></tr><tr><td>1</td><td>fpedestrians___1</td><td>Traffic light for pedestrians</td></tr><tr><td>2</td><td>fpedestrians___2</td><td>Central median</td></tr><tr><td>3</td><td>fpedestrians___3</td><td>protection of walkways by walls</td></tr><tr><td>4</td><td>fpedestrians___4</td><td>Zebra crossings</td></tr><tr><td>5</td><td>fpedestrians___5</td><td>Sidewalks</td></tr><tr><td>7</td><td>fpedestrians___7</td><td>Lighted zebra crossings</td></tr><tr><td>8</td><td>fpedestrians___8</td><td>Note of school zones</td></tr><tr><td>9</td><td>fpedestrians___9</td><td>Pedestrian Lane on the road for walking</td></tr><tr><td>90</td><td>fpedestrians___90</td><td>Others</td></tr><tr><td>99</td><td>fpedestrians___99</td><td>Unknown</td></tr></table></td></tr>
<tr><td>181</td><td>density</td><td>If you are at a junction choose the road that seems to have the most traffic and look down one direction of it. In a rondpoint look at the traffic in the circle. Using the clock on your tablet click on the hourglass shape and type 2 then 0 then 0 again. This will start a timer of 2 minutes during which you must count the following items. If you think it is possible you can count more then one during each 2 minute period, it will be easiest to write the results in your notepad then enter the numbers in redcap.</td><td>descriptive</td></tr>
<tr><td>182</td><td>density_level</td><td>Heavy or light traffic
You will need to perform density counts at each location at a heavy and a light traffic time. There is a different survey with the same questions about density that you can complete in addition to this one. If on this one it is a heavy traffic time you should complete the other density survey during a low traffic time.</td><td>radio<table><tr><td>0</td><td>Light traffic</td></tr><tr><td>1</td><td>Heavy traffic</td></tr></table></td></tr>
<tr><td>183</td><td>density_heavy
Show the field ONLY if: [density_level] = '1'</td><td>Is the traffic so heavy that vehicles are barely moving?</td><td>yesno<table><tr><td>1</td><td>Yes</td></tr><tr><td>0</td><td>No</td></tr></table></td></tr>
<tr><td>184</td><td>density_cars</td><td>Count the number of cars</td><td>text</td></tr>
<tr><td>185</td><td>density_trucks</td><td>Count the number of large trucks</td><td>text</td></tr>
<tr><td>186</td><td>density_bikes</td><td>Count the number of bicycles</td><td>text</td></tr>
<tr><td>187</td><td>density_motos</td><td>Count the number of motos</td><td>text</td></tr>
</table>

188	density_big_bus	Count the number of big busses	text
189	density_coasters	Count the number of coasters	text
190	density_taxi_bus	Count the number of taxi busses	text
191	density_peda_crossing	Count the number of pedestrians crossing the road	text
192	density_peds_road	Count the number of pedestrians walking in the road	text
193	density_turns	Count the number of turns you see from a non-turning lane *An example is at sopetrade, where the right lane is intended to be used for cars traveling straight through the junction but often people make turns from that lane instead of waiting in the left turning lane*	text
194	density_bike_helmet	Count the number of bicyclists you see wearing any kind of helmet	text
195	density_bike_helmet_odd	Count the number of bicyclists you see wearing a helmet that is clearly not designed for biking *like a hard hat that is usually used on a construction site*	text
196	density_motos_helmet	Count the number of moto drivers or passengers NOT wearing a helmet	text
197	density_motos_strap_pass	Count the number of moto passengers not using the strap properly *This includes the strap being unbuckled or buckled so loose that you are able to see at least 3 cm of space between the strap and the chin*	text
198	density_motos_strap_drive	Count the number of moto drivers not using the strap properly *This includes the strap being unbuckled or buckled so loose that you are able to see at least 3 cm of space between the strap and the chin*	text
199	density_motos_white	Count the number of moto drivers or passengers wearing a white helmet	text
200	density_motos_lights	Count the number of motos that are running their headlights during the day	text
201	density_motos_vision	Count the number of moto drivers with obscured vision due to a cracked or painted faceshield	text
202	comments	Please type any other comments you have this hotspot - you can leave this blank if you have nothing to add	text
203	bea_complete	Complete?	dropdown 0 Incomplete 1 Unverified 2 Complete