Tesla FSD (Supervised) and active road users in Belgium: a like-for-like replication of the johanna.be study

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24 November 2026

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Executive summary

Two months after the johanna.be study, the same FSD version applies 30 km/h on most signed zone 30s once it recognises the sign. It still applies 50 km/h where the Brussels regional default of 30 applies without a sign, does not reliably hold zone, cycle-street and home-zone regimes, and occasionally misses small signs.

This study repeats the johanna.be test (July 2026) like for like, on the same locations with a second vehicle, a Tesla Model X running the same FSD version (v14.2.2.6) throughout. After a preliminary run on 30 September, three filmed runs on 4, 11 and 18 October 2026 covered 45 of the johanna.be locations in 61 scored runs. Five patterns stand out:

- **Signed zone 30.** The July failure mode (the 30 km/h sign is observed, but the car keeps 50) was not seen on most signed segments. It did occur on three: on 3a (4 October), 13a and Diepestraat in Wemmel (F04, 18 October) a recognised 30 lasted only briefly before the car returned to 50 inside the zone.

- **Missed signs.** Small zone signs were sometimes not recognised (3a and 3b on 4 October, 11a and 11b on 11 October, 15a and 15b on 18 October).
- **Brussels default 30.** On unsigned streets the car displayed 50 on every run (17a, 18a, 8a, 8b, 12a and 12b). On several of these the Brussels Mobility data already gives 30.
- **Cycle streets.** The cycle-street limit was lost after intersections, and the car overtook cyclists on Warotstraat.
- **Home zones.** Mixed. Two Brussels home zones displayed 20, as in July; Dumonplein, the Marollen and Jean Deraeckstraat displayed 30, and two Wemmel home zones displayed 50 although the official Flemish data has them at 20.

Public data contributes to the Brussels default failures but is not the only cause. Brussels Mobility publishes two official layers that contradict each other on the same segments, local roads carry no value, and Brussels delivers no structured speed-limit data to the national access point (transportdata.be). At the same time, the car also displayed 50 on segments where the Brussels data gives 30, and in Wemmel home zones that the Flemish data records correctly.

The study recommends that Tesla encode the Brussels regional default and treat zone signs (F4a, F111, F12a) as zones valid until their end sign, and that Brussels Mobility publish one unambiguous speed-limit layer and deliver it through the national access point under Delegated Regulation (EU) 2022/670.

Both studies found FSD careful and courteous towards pedestrians and cyclists. The driver-settable speed offset was not tested in a structured way. The author's personal view on what the results mean for the approval is given separately, in the Author's assessment.

Introduction

This is an independent replication of the johanna.be study published on 4 September 2026, using a second vehicle two months later.

The johanna.be study ("Tesla FSD (supervised) and active road users", Geert van Waeg) [1] found that FSD exceeded the limit in 55% of tested Brussels 30 km/h segments, often while displaying a 50 km/h limit after correctly observing a 30 km/h sign. It received wide media coverage [15] ahead of the EU Technical Committee on Motor Vehicles (TCMV) discussions on EU-wide approval.

A single test with a single vehicle cannot separate system behaviour from vehicle, timing or location effects. This replication uses the same locations and the same FSD version, a different vehicle model, and a later date.

Johanna.be shared its test locations for this purpose and explicitly left full editorial control with the author. The author thanks Geert van Waeg for that openness.

Author disclosure. The author is a private individual and a daily FSD (Supervised) user. He is not affiliated with Tesla, johanna.be, or any manufacturer, and received no compensation. Raw video of the filmed runs (4, 11 and 18 October) is available on request.

Speed definitions

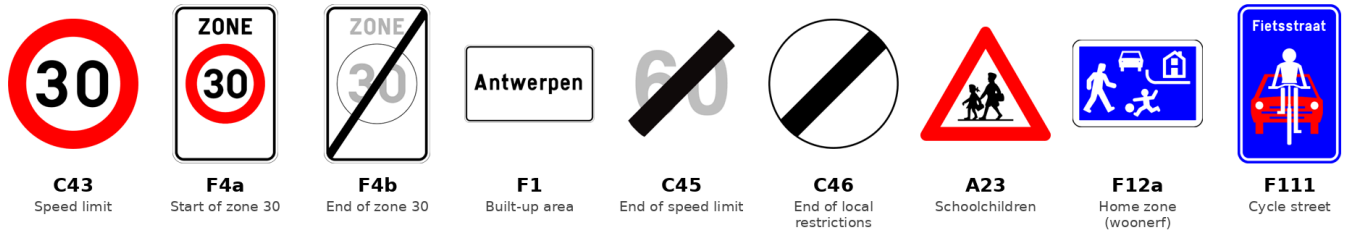
Definitions follow the johanna.be report so results can be compared one to one.

Term	Meaning
Legal speed limit	The maximum legal speed for the lane, posted or implicit (for example the Brussels regional default)
Vehicle speed	Speed shown on the vehicle display (indicated, not GPS)
Observed speed limit	Limit the system shows briefly in the car status area when passing a sign
Displayed speed limit	Limit the system presents to the driver as applicable to the current lane
Maximum speed	Highest speed up to which FSD will control the vehicle
Segment speed	Maximum vehicle speed reached in a test segment

Note on speed values: the test vehicle's display reads about 2 km/h above GPS speed (for example 120 indicated is 118 GPS). All speeds are indicated (dashboard) values unless marked (GPS).

Belgian traffic signs referenced in this report

Sign codes follow the Belgian Highway Code (Royal Decree of 1 December 1975) [2]; the rules that matter here are summarised below.



C43 Speed limit | **F4a** Start of zone 30 | **F4b** End of zone 30 | **F1** Built-up area | **C45** End of speed limit | **C46** End of local restrictions | **A23** Schoolchildren | **F12a** Home zone (woonerf) | **F111** Cycle street

Sign images: Wikimedia Commons, public domain (Belgian road signs are part of Belgian legislation).

Official Belgian road signs C43, F4a, F4b, F1, C45, C46, A23, F12a and F111 (public domain, Wikimedia Commons)

Sign	Meaning	Relevance in this study
C43	Maximum speed as shown	A single limit sign; in principle valid until the next intersection unless repeated [2]
F4a	Start of a zone 30	30 km/h applies on all roads in the zone until the F4b sign [2][3]; mandatory around school entrances [4]
F4b	End of a zone 30	Ends the F4a zone
F1	Start of a built-up area	Default limit 50 km/h in Flanders and Wallonia, but 30 km/h in the Brussels-Capital Region (art. 11.1) [2]: the same sign means a different limit per region
C43 50 in Brussels	Higher limit on a Brussels main road	Only roads with such a sign may exceed the Brussels 30 km/h default [2][5]
C45	End of a speed limit	Ends a limit set by C43
C46	End of all local prohibitions	Ends all prior local restrictions
A23	Warning: school or children	Often placed with zone 30 at schools
F12a	Home zone (woonerf)	20 km/h; pedestrians may use the full width of the road [2] (art. 22bis)

Sign	Meaning	Relevance in this study
F111	Cycle street	30 km/h; motor vehicles may not overtake cyclists [2] (art. 22novies)

Abbreviations

Abbreviation	Meaning
FSD	Tesla Full Self-Driving (Supervised), a driver control assistance system; in Europe being renamed Tesla Assisted Driving (TAD) since October 2026 [18]
ISA	Intelligent Speed Assistance [8][9]
NAP	National access point for road and traffic data; in Belgium transportdata.be [10][11]
RDW	Netherlands Vehicle Authority, which issued the provisional approval [6]
TCMV	Technical Committee on Motor Vehicles of the European Commission
TAD	Tesla Assisted Driving, the new European name for FSD (Supervised) [18]
TN-ITS	Standard for exchanging changes in road attribute data, including speed limits
UN R171	UN Regulation No. 171 on driver control assistance systems (DCAS) [7]
UrbIS	Brussels-Capital Region's reference road and address database

Regulatory context

As of 24 November 2026, FSD (Supervised) is used in Belgium under a Dutch provisional approval, and EU-wide approval is still under discussion.

- **Approval route.** The Dutch authority RDW granted a provisional approval on 10 April 2026 under Article 39 of Regulation (EU) 2018/858, assessed against UN Regulation No. 171 (driver control assistance systems) [6][7]. Belgium recognised it on 10 June 2026 [19].
- **EU decision.** EU-wide validity requires a qualified majority in the TCMV. The 6 October 2026 agenda lists only a continuation of discussions; December is the earliest possible vote [19].
- **New name in Europe.** Since early October 2026 Tesla has been renaming the product in Europe from "Full Self-Driving (Supervised)" to "Tesla Assisted Driving" (TAD); the German Tesla website no longer uses the FSD name. According to the German Federal Ministry of Transport, whose statement of 6 October called the old name misleading because the driver keeps the full driving task, Tesla offered the new name in talks with the minister in September [18]. The rename came ahead of an expected EU-wide vote on approval, for which the German minister has said he will advocate [18]. No change to the software's function has been reported, and on 11 October the car still displayed "FSD (Supervised)". This report keeps the name FSD (Supervised), under which the system was approved and tested, and the in-car version label FSD 14.2.2.6. On 3 November 2026 the RDW approved the new name and a cap of the speed margin at +10% (0% by default); the tests in this report predate that change [20].
- **Speed limits in UN R171.** The system must aim to determine the applicable speed limit (par. 5.3.7.4.1) and lower its maximum speed when it determines a lower limit (par. 5.3.7.4.7.3.3).

- **Speed-limit data.** Under Delegated Regulation (EU) 2022/670, authorities make road data, including speed limits, available through a national access point. In Belgium that is transportdata.be [10][11]. Obligations are phased in over time.
- **Brussels rule.** Since 1 January 2021, the Brussels version of article 11.1 of the Highway Code limits speed within built-up areas to 30 km/h [2], with higher limits only where signed [5]. Elsewhere in Belgium the built-up-area default is 50 km/h. The 1975 Highway Code applies until 1 June 2027, when four codes replace it (federal, Brussels, Flemish and Walloon); most current signs remain valid until 1 January 2045 [2]. Regional differences in traffic rules are set to grow.

Methods

The protocol fully mirrors johanna.be's: FSD chooses the speed, and the driver intervenes only for safety, not to correct speed.

Item	This study	johanna.be (July 2026)
Vehicle	Tesla Model X	Tesla Model 3 (registered June 2026)
Software	2026.27.300 (30 Sep, 4 Oct); 2026.33.100 (11 and 18 Oct)	2026.21.100
FSD version	v14.2.2.6	v14.2.2.6
Mode	Standard	Standard
Speed offset	0%	0%
Contextual max speed	Off	Off
Test dates	30 Sep 2026 (preliminary, Woluwe), 4 Oct 2026, 11 Oct 2026, 18 Oct 2026	20 to 22 Jul 2026
Conditions	Dry. 30 Sep: weekday. 4 Oct: Sunday morning, light traffic. 11 Oct: Sunday afternoon, heavy congestion with several Brussels tunnels closed. 18 Oct: Sunday morning, 08:45 to 11:20	Dry, includes a public holiday
Recording	Insta360 GO 3 (screen and windscreen) on 4, 11 and 18 Oct, plus TeslaCam (six cameras) on 4 Oct; vehicle position and speed logged by TeslaMate. The 30 Sep run was not filmed by the author	GoPro (screen and windscreen)

Locations. The Brussels segments follow the map and segment numbers in the johanna.be report; they were placed from the johanna.be map arrows, checked against Brussels Mobility data and on site, as johanna.be supplied no exact coordinates for them. The Flemish segments (F01 to F06) were supplied by johanna.be. Home zones and cycle streets follow the johanna.be list. Wallonia was not tested (see Limitations).

Recorded per run. Date and time, segment and direction, whether the sign was observed, observed speed limit, displayed speed limit, maximum speed, segment speed, driver intervention, and free-flow conditions.

Driver interventions. As in the johanna.be study, the driver does not lower the maximum speed when the system applies a limit above the legal limit, so segment speeds show what the system actually does. The driver intervenes only when safety requires it, for example near pedestrians or cyclists. Every intervention is logged with its reason.

Cycle streets (F111). Limit 30 km/h; motor vehicles may not overtake cyclists [2]. As in the johanna.be study, the driver lets FSD choose its speed but aborts any overtaking attempt before the vehicle is alongside the cyclist. Each attempt is logged (indicator on, planned path to the left, abort point). Following the advice of the johanna.be author, each cycle street is driven twice: once behind a cyclist, preferably a slow one, to test overtaking behaviour, and once in free flow to test the applied speed.

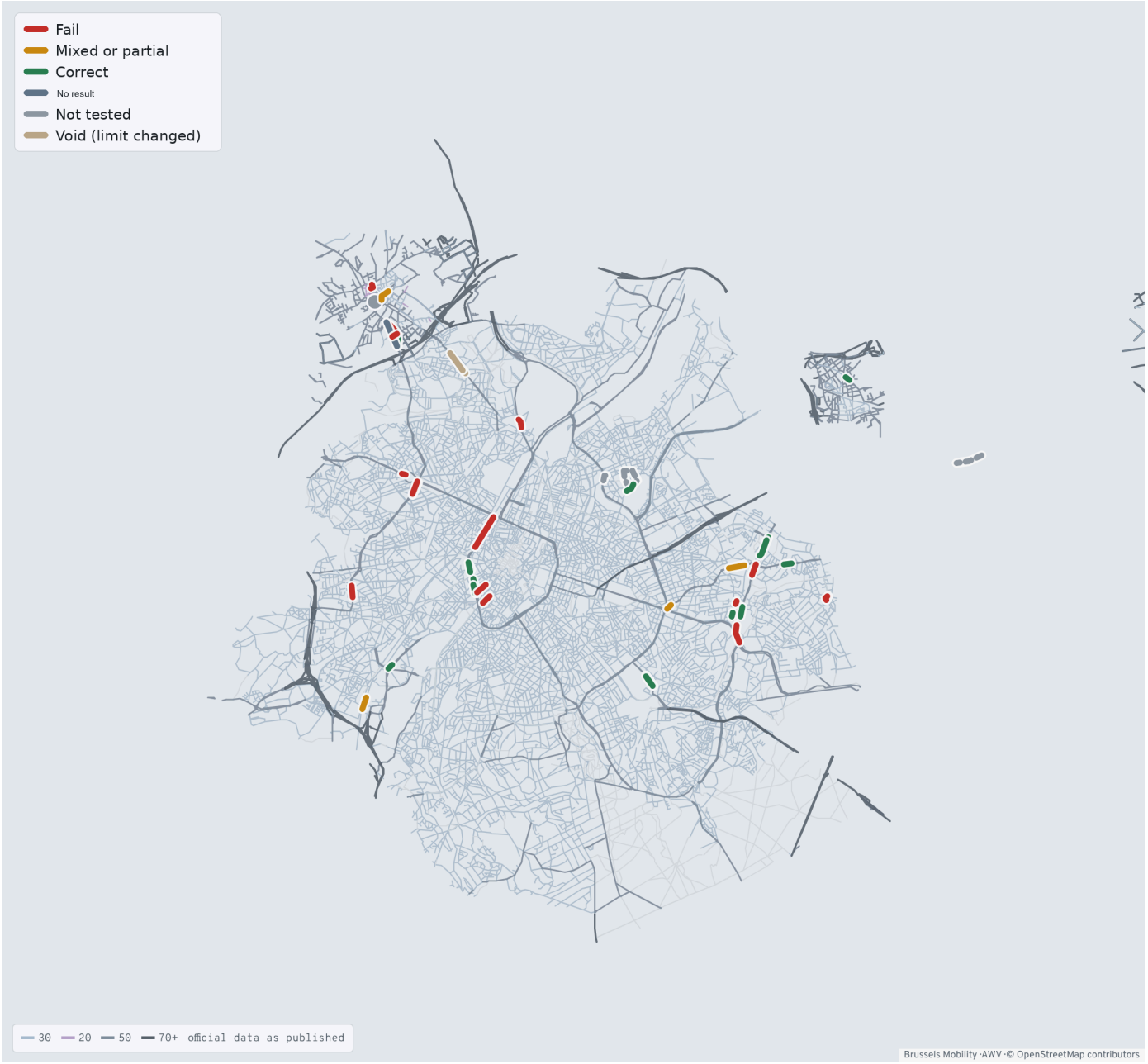
Home zones (F12a). Limit 20 km/h; pedestrians and playing children may use the full road width [2]. FSD chooses its speed; the driver intervenes immediately when people are on or near the carriageway.

Speed offset test

johanna.be cites the driver-settable speed offset as a reason to revoke the provisional approval. No structured offset test was run in this study, and all scored runs used a 0% offset. The author drives with a +10% offset in daily use; that experience is reported in the Author's assessment, not as a measured result.

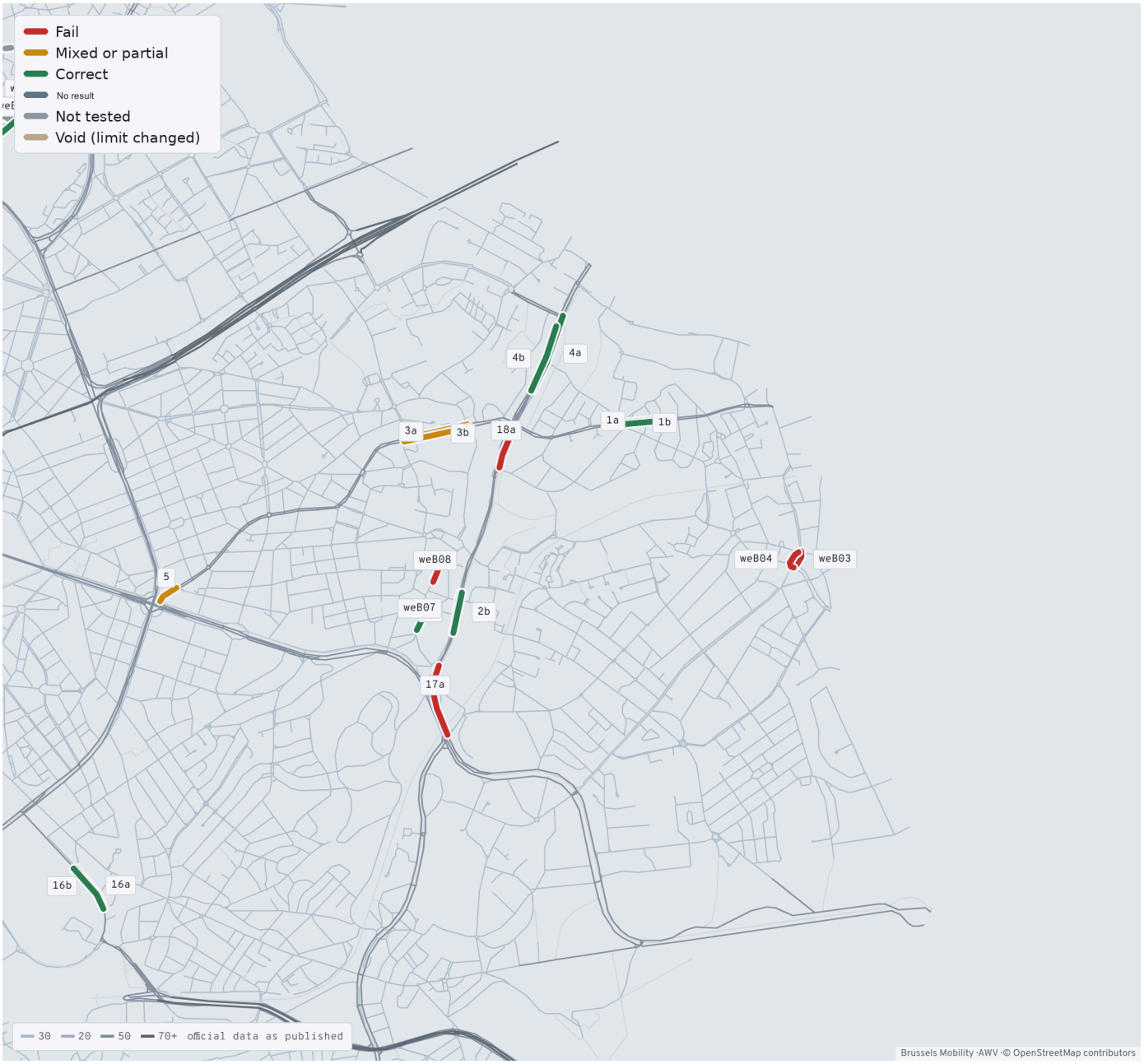
Test locations

The test covers the johanna.be segments in Brussels and Flanders; maps are drawn from Brussels Mobility open data and OpenStreetMap, not by hand.



Brussels test stretches coloured by result (red fail, orange mixed or partial, green correct, grey not tested, beige void, blue-grey no result), on the official speed-limit network as published

The original johanna.be segment map (July 2026, base map MOBIGIS / Brussels Mobility) is on page 32 of the johanna.be report [1]. Its arrows were drawn by hand and are approximate; the map above places each segment on the carriageway and 30 extent in the official data.



Woluwe cluster: segments 1 to 5, 16a/16b, 17a, 18a and Dumonplein, coloured by result (red fail, orange mixed or partial, green correct, grey not tested, beige void, blue-grey no result)



Flemish locations coloured by result (red fail, orange mixed or partial, green correct, grey not tested, beige void, blue-grey no result): Wemmel, Zaventem, and Bertem, Kortenberg and Winksele

Segment	Region	Street (approximate)	Start (lat lon)	End (lat lon)	Status
1a	Brussels	Émile Vanderveldelaan, Sint-Lambrechts-Woluwe, eastbound (zone 30 stretch)	50.8477 4.4497	50.8478 4.4524	4 Oct: correct
1b	Brussels	Émile Vanderveldelaan, Sint-Lambrechts-Woluwe, westbound (zone 30 stretch)	50.8477 4.4524	50.8476 4.4497	4 Oct: correct
2a	Brussels	Woluwelaan, Sint-Pieters-Woluwe, southbound (zone 30 on the main road)	50.8381 4.4351	50.8358 4.4344	11 Oct: correct
2b	Brussels	Woluwelaan, Sint-Pieters-Woluwe, northbound (zone 30 on the main road)	50.8358 4.4344	50.8381 4.4352	4 Oct: correct
3a	Brussels	Paul Hymanslaan, Sint-Lambrechts-Woluwe	50.8475 4.4357	50.8468 4.4302	11 Oct: correct (4 Oct: zone dropped, then sign missed)
3b	Brussels	Paul Hymanslaan, Sint-Lambrechts-Woluwe	50.8466 4.4301	50.8474 4.4359	11 Oct: correct after late recognition
4a	Brussels	Woluwedal (north), Sint-Lambrechts-Woluwe, northbound (eastern carriageway)	50.8495 4.4416	50.8537 4.4442	4 Oct: correct
4b	Brussels	Woluwedal (north), Sint-Lambrechts-Woluwe, southbound (western carriageway)	50.8531 4.4436	50.8495 4.4414	4 Oct: correct
5	Brussels	de Broquevillelaan, Sint-Pieters-Woluwe	50.8383 4.4099	50.8376 4.4083	11 Oct: 50 on the last stretch
6a	Brussels	Zuidlaan, Brussel, northbound (eastern carriageway)	50.8410 4.3405	50.8442 4.3394	11 Oct: correct
6b	Brussels	Zuidlaan, Brussel, southbound (western carriageway)	50.8431 4.3392	50.8410 4.3399	11 Oct: correct (driver's account)
7a	Brussels	Slachthuislaan, Brussel, northbound (eastern carriageway)	50.8464 4.3386	50.8471 4.3384	11 Oct: correct
7b	Brussels	Slachthuislaan, Brussel, southbound (western carriageway)	50.8481 4.3375	50.8458 4.3382	11 Oct: correct (driver's account)
8a	Brussels	Nieuwpoortlaan, Brussel, northbound	50.8516 4.3400	50.8582 4.3465	11 Oct: fails (50 displayed)

Segment	Region	Street (approximate)	Start (lat lon)	End (lat lon)	Status
8b	Brussels	Nieuwpoortlaan, Brussel, southbound (same road as 8a)	50.8582 4.3465	50.8516 4.3400	11 Oct: fails (50 displayed)
9a	Brussels	Poxcatstraat, Anderlecht	50.8264 4.3120	50.8238 4.3090	11 Oct: correct
10a	Brussels	Aakaai, Anderlecht: eastern canal-side road, both directions	50.8176 4.3011	50.8150 4.2997	11 Oct: 20 then 30 shown, 30 driven
11a	Brussels	Maria Groeninckx-De Maylaan, Anderlecht, southbound (western carriageway)	50.8428 4.2959	50.8401 4.2963	11 Oct: sign missed
11b	Brussels	Maria Groeninckx-De Maylaan, Anderlecht, northbound (eastern carriageway)	50.8401 4.2965	50.8428 4.2961	11 Oct: sign missed
12a	Brussels	Emile Bossaertlaan, Koekelberg (northbound, eastern carriageway)	50.8632 4.3177	50.8661 4.3198	18 Oct: fails (50 displayed)
12b	Brussels	Emile Bossaertlaan, Koekelberg (southbound, western carriageway)	50.8663 4.3194	50.8633 4.3175	18 Oct: fails (50 displayed)
13a	Brussels	Keizer Karellaan, Ganshoren	50.8677 4.3152	50.8685 4.3122	18 Oct: zone dropped after about 20 m
14a	Brussels	Houba-de Strooperlaan, Laken (northbound)	50.8906 4.3358	50.8944 4.3310	Void: signed 50 in October (30 on the johanna.be map)
14b	Brussels	Houba-de Strooperlaan, Laken (southbound)	50.8938 4.3294	50.8900 4.3340	Void: signed 50 in October (30 on the johanna.be map)
15a	Brussels	Wijngaardenstraat, Laken (position uncertain)	50.8827 4.3539	50.8769 4.3577	18 Oct: sign missed
15b	Brussels	Wijngaardenstraat, Laken (position uncertain)	50.8771 4.3572	50.8825 4.3544	18 Oct: sign missed
16a	Brussels	Triomflaan, Elsene, northbound (opposite direction of 16b)	50.8203 4.4033	50.8225 4.4006	11 Oct: correct
16b	Brussels	Triomflaan, Elsene, southbound	50.8225 4.4006	50.8203 4.4033	11 Oct: correct
17a	Brussels	Connector from Tervurenlaan to Woluwelaan, northbound, Sint-Pieters-Woluwe	50.8301 4.4340	50.8340 4.4331	11 Oct: fails (50 displayed)

Segment	Region	Street (approximate)	Start (lat lon)	End (lat lon)	Status
18a	Brussels	Woluwedal, parallel local road, Sint-Lambrechts-Woluwe (UrbIS 155059872)	50.8451 4.4386	50.8475 4.4399	11 Oct: fails (50 displayed)
F01	Flanders	Bertem, Bosstraat (Vuikelaan to Tervuursesteenweg)	50.8687 4.6312	50.8676 4.6356	From johanna.be, ends approximate
F02	Flanders	Zaventem, Steenokkerzeelstraat (Groenstraat to Heidestraat)	50.8889 4.4732	50.8897 4.4717	From johanna.be
F03	Flanders	Wemmel, Isidoor Meyskensstraat	50.8960 4.3125	50.8995 4.3124	From johanna.be
F04	Flanders	Wemmel, Diepestraat	50.8996 4.3121	50.9018 4.3088	From johanna.be
F05	Flanders	Wemmel, Steenweg op Brussel (Vanderzijpen to roundabout)	50.8970 4.3118	50.9020 4.3083	From johanna.be, ends approximate
F06	Flanders	Wemmel, Maalbeeklaan	50.9056 4.3057	50.9076 4.3027	From johanna.be

Coordinates are latitude and longitude (WGS84). Brussels positions and directions were derived by registering the johanna.be map onto the Brussels Mobility layer and placing each arrow on the nearest 30 km/h stretch of a main road. Start and end points mark direction, not the exact extent of each zone; street names are indicative.

Cycle streets and home zones. Locations follow the johanna.be report.

Type	Location	Coordinates (approx.)	Official data	OpenStreetMap
Cycle street (F111)	Brussels, side road along the Lambermontlaan, northwest from Gilisquetlaan	50.8675 4.3863	No cycle street encoded; side road has no value or code 13	Lambermontlaan tagged as under construction, 30
Cycle street (F111)	Winksele, Warotstraat (about 600 m); extra plate with C43 30 and "do not overtake cyclists" at the start	50.8994 4.6368	AWV: 30, F111	Cycle street, 30
Cycle street (F111)	Winksele, Klein Dalenstraat	50.9010 4.6519	AWV: 30, F111	Cycle street, 30
Cycle street (F111)	Zaventem, Van Ingelgomstraat (Voskapel); alternating parking and speed cushions	50.8708 4.5156	AWV: no cycle street found	Tertiary road, 50, not tagged as cycle street
Cycle street (F111)	Kortenberg, Kerselarenstraat (cycle-street part, west to the main road)	50.8971 4.5864	AWV: 30, cycle street	Residential, 50, not tagged as cycle street

Type	Location	Coordinates (approx.)	Official data	OpenStreetMap
Cycle street (F111)	Rixensart, Avenue de Nivelles; vertical sign poorly visible from rue Rauscent, large road markings	50.7041 4.5474	No Walloon data found	Residential, 50, not tagged as cycle street
Home zones (F12a)	12 locations, see the home zone table below			

Replicability. To make this study repeatable without the author's help, it publishes every tested location with coordinates and direction, the maps generated from source data, the data queries used (Appendix D), and the per-run test log (Appendix B). Raw video is available on request.

Home zones (F12a, 20 km/h), as supplied by johanna.be.

Code	Location	Coordinates (approx.)	johanna.be (July): displayed / segment speed (km/h)	johanna.be note
weB01	Brussels, Nieuwland and Jagerstraat (Marollen)	50.8397 4.3443	30 / 18	Displays 30, adheres to 20
weB02	Brussels, Kazernestraat	50.8421 4.3422	30 / 19	Displays 30, adheres to 20
weB03	Sint-Pieters-Woluwe, Dumonplein, northbound	50.8398 4.4652	30 / 25	Zone not identified, 20 not respected
weB04	Sint-Pieters-Woluwe, Dumonplein, southbound	50.8398 4.4652	30 / 25	Zone not identified, 20 not respected
weB05	Schaarbeek, Terdelt (between Gilisquetlaan and Wouters)	50.8626 4.3926	20 / 17	Not tested
weB06	Schaarbeek, Arthur Rolandstraat (behind Gilisquetlaan)	50.8646 4.3952	20 / 12	Correct
weB07	Sint-Pieters-Woluwe, René Declercqstraat	50.8363 4.4314	20 / 18	Correct
weB08	Sint-Pieters-Woluwe, Jean Deraeckstraat	50.8390 4.4328	30 / 16	Respected, displays 30
weF01	Wemmel, J. De Ridderlaan (Steenweg op Brussel to De Blockplein)	50.8991 4.3113	50 / 28	Speeding
weF02	Wemmel, Steenweg op Merchtem near Sint-Servaaskerk	50.9096 4.3024	50 / 23	Displays 30 briefly, then 50
weF03	Wemmel, J. Vanden Broeckstraat	50.9081 4.3080	30 / 29	Speeding, vertical and horizontal signage
weW01	Rixensart, Rue des Écoles	50.7145 4.5327	20 / 13	Correct

Zone 30 segments in Wallonia (W01 to W04), as supplied by johanna.be. These locations were not tested in this study (see Limitations); they are listed as johanna.be supplied them.

Code	Location	Coordinates (start, end, approx.)	johanna.be note
Not mapped	Wavre, Chaussée de Louvain, from rue Florimond Letroye to past Place Bosch	50.7150 4.6135; 50.7134 4.6105	Initially displayed 30, then 50 on the square itself
Not mapped	Wavre, Rue Sainte-Anne	50.7180 4.6014	No detail supplied

Video clips: to follow.

Results

Results are reported per run. The preliminary run of 30 September was made with Geert van Waeg and a Reuters journalist in the car and was not filmed by the author; all its segments were driven again on filmed runs, and the scored results rest on those.

Preliminary run, Woluwe (30 September 2026)

Segment	johanna.be July: displayed / segment speed (km/h)	This study: result	Vertical zone sign in July (F4a)
1a	30 / 30	Correct	Yes
1b	50 / 45	Correct	Yes
2a	50 / 50	Correct	Yes
2b	50 / 35	Correct	Yes
3a	50 / 30	Correct	Yes
3b	50 / 45	Correct	No (F4a added after July, per johanna.be)
4a	50 / 45	Correct	Yes
4b	50 / 49	Correct, except 1 run (sign not observed)	Yes
17a	50 / 43	Failed every run: applied 50, segment speed 41 to 42	No (Brussels default 30)
18a	50 / 46	Failed every run: applied 50	No (Brussels default 30)

Segments 17a and 18a are parallel local roads where johanna.be also recorded no vertical signage. johanna.be's own subgroup of such "default 30" segments showed speeding in 75% of cases.

Second run (4 October 2026)

Second run on Sunday 4 October 2026, same vehicle and software. Speeds are speedometer readings (about 2 km/h above GPS).

Segment	johanna.be July: displayed / segment speed (km/h)	30 September	4 October
1a	30 / 30	Correct	Correct
1b	50 / 45	Correct	Correct
2a	50 / 50	Correct	Correct
2b	50 / 35	Correct	Correct

Segment	johanna.be July: displayed / segment speed (km/h)	30 September	4 October
3a	50 / 30	Correct	Intermittent: pass 1 recognised 30, then displayed 50 before the zone end; pass 2 displayed 50, drove 32 to 33
3b	50 / 45	Correct	Failed: displayed 50, drove 45 (one FSD pass)
4a	50 / 45	Correct	Correct
4b	50 / 49	Correct, except 1 run	Correct on both passes (displayed 30 and drove 30 to 31 in the zone)
17a	50 / 43	Failed: 50 applied, 41 to 42	Failed: 30 not applied; displayed 50, up to 33
18a	50 / 46	Failed: 50 applied	Failed: displayed 50, up to 41

Paul Hymanslaan (3a/3b). Correct in every run on 30 September, but not on 4 October, when it was re-driven three times under FSD. Westbound, the first pass recognised the 30 but displayed 50 before the end-of-zone sign; the second pass did not recognise the zone and displayed 50, yet drove 32 to 33 km/h. Eastbound, the zone was not recognised: 50 displayed, 45 km/h driven. A fourth pass was driven without FSD engaged; the car's sign reading displayed 30 on that pass, but it is not an FSD result and is excluded. On 11 October both directions were correct again, eastbound only after late recognition. The zone 30 signs here are the smallest size allowed in Belgium, and on 4 October the car was in the left lane, on 11 October in the right lane; lane position relative to small signs is a plausible factor, not a proven one. The segment is intermittent across days rather than consistently failing, and shows a third failure mode besides a missed sign and the unknown regional default: a recognised zone released too early.

Pedestrians. At crosswalks the vehicle slowed for crossing pedestrians (to 29 km/h on the Woluwelaan) and then resumed 30.

Interaction with traffic. Where FSD applied 30 km/h correctly, surrounding traffic regularly overtook it.

Outside the johanna.be sample. Roads traversed between test locations, including zone 30 streets in Schaerbeek and side streets around Dumonplein, showed no speed-limit issues, and a home zone in Schaerbeek (location not confirmed) was displayed and driven at 20 km/h. These are incidental observations, not a measured rate.

Third run (11 October 2026)

Between the second and third run the car received a firmware update. The FSD version stayed the same in all runs of both studies:

Run	Firmware	FSD
johanna.be, July 2026	2026.21.100	14.2.2.6
This study, 30 Sept and 4 Oct 2026	2026.27.300	14.2.2.6
This study, 11 and 18 Oct 2026	2026.33.100	14.2.2.6

Differences between runs therefore cannot come from the FSD neural network itself; they can come from firmware, map data or conditions. The 2026.33.100 release notes mention nothing on speed limits or maps [17].

The run focused on johanna.be failures not yet re-driven, plus the Woluwe segments as a control. It took place on a Sunday afternoon with heavy congestion (several Brussels tunnels closed), so few runs were in free flow.

Segment	johanna.be July: displayed / segment speed	Earlier runs, this study	11 October
3a	50 / 30	Correct (30 Sept); intermittent (4 Oct)	Correct, westbound, right lane
3b	50 / 45	Correct (30 Sept); failed, 45 (4 Oct)	Correct, eastbound, after late recognition
2a	50 / 50	Correct, both runs	Correct: 30 applied from the zone start, 50 only where signed
4b	50 / 49	Correct, except 1 run (30 Sept); correct, 2 passes (4 Oct)	Correct: 50, then 30 from the zone sign, 50 again after the zone
17a	50 / 43	Failed, both runs	Failed: 50 displayed, up to 44
18a (Woluwedal parallel road)	50 / 46	Failed, both runs	Failed: 50 displayed, up to 45
5	50 / 35	Not driven	Partly: 50 displayed on the last stretch before the roundabout (up to 41 km/h; no 50 sign there), although the Brussels data has 30 there; 30 after it
16b	50 / 30	Not driven	Signed 50 stretch correct; small 30 sign recognised at low speed
16a	50 / 30	Not driven	Correct: 30 recognised, northbound on Triomflaan at 28 to 30 km/h
6a	50 / no free flow	Not driven	Correct: 50, then 30 from the zone sign
7a	50 / no free flow	Not driven	Correct: 50, then 30 from the zone sign
8a	50 / no free flow	Not driven	Failed: no sign (regional default), 50 displayed
8b	40 / 30	Not driven	Failed: no sign (regional default), 50 driven
9a	30 / 30	Not driven	Correct
10a	50 / 45	Not driven	Driven speed correct (30); display showed 20 before 30, both directions
11a	50 / 49	Not driven	Failed: zone 30 sign not recognised, southbound; speed not recorded
11b	50 / 49	Not driven	Failed: zone 30 sign not recognised, northbound, up to 35 km/h (GPS)
weB01	30 / 18	Not driven	Failed: 30 displayed in a 20 home zone; 17 driven, set by the street width
weB02	30 / 19	Not driven	Failed: 30 displayed in a 20 home zone; 18 driven; steering intervention at the start

Segment	johanna.be July: displayed / segment speed	Earlier runs, this study	11 October
6b	Not listed	Not driven	Correct: sign recognised, 30 applied (driver's account after the run)
7b	Not recorded	Not driven	Correct: sign recognised, 30 applied (driver's account)

Signed zones. Where the car recognised a zone 30 sign, it applied it every time (3a, 3b, 6a, 7a, 2a, 16a, and the 30 sign on 16b). The July failure mode, observing the sign and driving on at 50, was not seen. The remaining failure on signed segments is recognition itself: on Maria Groeninckx-De Maylaan the zone 30 sign was missed in both directions (11a and 11b), and 3b was caught late. On that road a bus lane on the right places the signs further from the cameras, which may explain the misses.

Regional default. On 17a, 18a, 8a and 8b, the car applied 50 where the Brussels default of 30 applies, as on earlier runs. On the Nieuwpoortlaan (8a, 8b) the Brussels data itself records 30, which points to the car's map data rather than the public data. Segment 5 showed 50 on its last stretch without any 50 sign, and 30 again after the roundabout, which points to a local error in the car's map data; the Brussels Mobility data has 30 on that stretch.

A new display error. On 10a (Aakaai, a canal-side road) the display showed 20 before 30 in both directions, although the road is zone 30 and no 20 appears in the johanna.be data. A nearby home zone was correctly shown as 20, so the 20 probably extends too far in the map data. Driven speed was not affected.

Behaviour. In the Marollen home zones the car slowed for and yielded to pedestrians walking in the road, and it gave way to a pedestrian crossing on a red light. It was regularly overtaken, once by a moped, and many human drivers were seen running red lights.

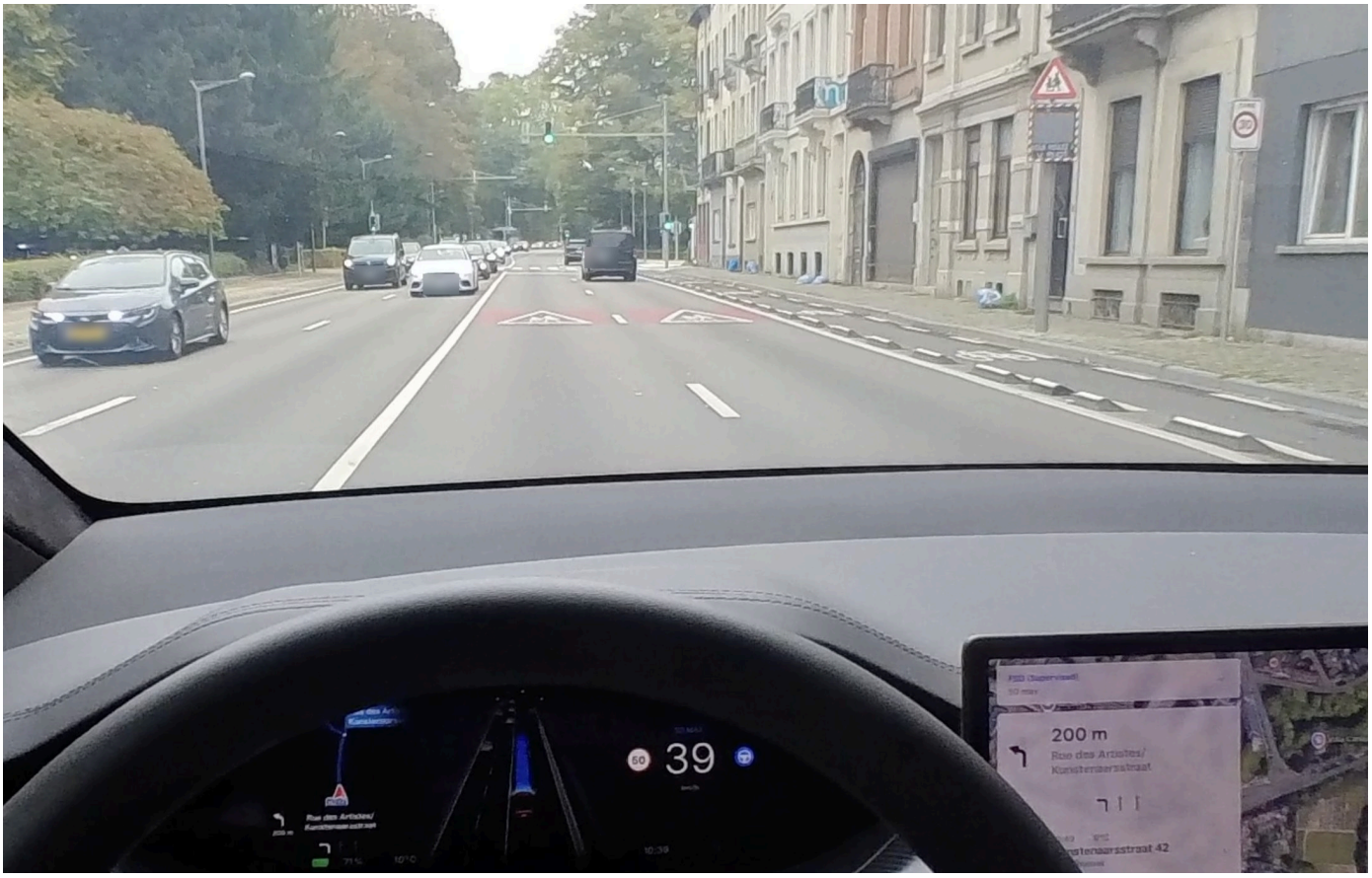
Fourth run (18 October 2026)

A Sunday run limited to locations not yet visited: the Woluwe and Schaerbeek home zones, the Lambermontlaan cycle street, segments 14 and 15 in Laeken, Wemmel, and segments 12a, 12b and 13a in Koekelberg and Ganshoren. Software was unchanged from 11 October: firmware 2026.33.100 (installed 7 October, per the TeslaMate update log) with FSD 14.2.2.6. The run took place between 08:45 and 11:20, about 130 km. F06 and the Van Ingelgomstraat cycle street were not reached. Segment 6b had been driven on 11 October (see the third run).

Code	Location	Legal limit	Displayed limit	Highest speed	Result	johanna.be (July)
weB07	René Declercqstraat, Sint-Pieters-Woluwe	20	20	15	Correct	20 / 18
weB08	Jean Deraeckstraat, Sint-Pieters-Woluwe	20	30	under 20 (street width)	Wrong limit displayed	30 / 16

Code	Location	Legal limit	Displayed limit	Highest speed	Result	johanna.be (July)
weB05	Terdelt garden quarter, Schaerbeek	20	Not tested	Not tested	Not tested (only Gilisquetlaan, outside the home zone, was driven; it displayed 30, correctly)	20 / 17
weB06	Arthur Rolandstraat, Schaerbeek	20	20	10	Correct	20 / 12
C05	Lambermontlaan side road, Schaerbeek	30	not driven		Route blocked off	Cyclist ahead blocked passing
15a	Near the Royal Palace, Laeken	30	50	34 (GPS; dashboard mostly hidden)	Sign missed	50 / 47
15b	Near the Royal Palace, Laeken	30	50	43	Sign missed	50 / 45
14a, 14b	Houba-de Strooperlaan, Laeken, both directions (johanna.be arrows)	50 (signed; 30 on the johanna.be map)	50	49	Void: now signed 50	30 / 30 and 50 / 30
F03	Isidoor Meyskensstraat, Wemmel	30	30 up to the roundabout	30	Correct (2 passes); zone lost after the roundabout, see F04	50 / 30
F04	Diepestraat, Wemmel (northbound from the roundabout)	30	50	31	Zone lost at the roundabout (continues F03)	50 / 34
F05	Steenweg op Brussel, Wemmel	30	50	31	Zone stretch not confirmed	no result
weF01	J. De Ridderlaan, Wemmel	20	50	about 25	Wrong limit displayed	50 / 28
weF03	J. Vanden Broeckstraat, Wemmel	20	30	30	Data conflict (see below)	30 / 29
weF02	Steenweg op Merchtem near the church, Wemmel	20	50	9 (street width)	Wrong limit displayed	50 / 23
12a	Emile Bossaertlaan northbound, Koekelberg	30 (default, unsigned)	50	35 (stop-and-go traffic)	Regional default not applied	50 / 46
12b	Emile Bossaertlaan southbound, Koekelberg	30 (default, unsigned)	50	50	Regional default not applied	50 / 32
13a	Keizer Karellaan, Ganshoren	30	30 briefly, then 50 after about 20 m	44, after the zone was lost	Zone lost inside the zone (2 passes)	50 / no free flow

15b, 14a and 14b. At 15b the zone 30 entry sign (F4a) stands on the right-hand side of the road, beyond a separated cycle lane, with school markings painted on the carriageway. The car kept displaying 50 from that sign to the end of the zone (a C43 50 sign with F4b below it), at up to 43 km/h, while other traffic pulled away from the test car. 14a and 14b are void. The johanna.be map shows the street at the arrows, south of Avenue des Amandiers / Amandelbomenlaan, as 30, but in October it was signed 50 in both directions, so it no longer tests a 30 limit. The car displayed 50 there, at up to 49 km/h, which matches the signs. North of Avenue des Amandiers, outside the johanna.be segments, the car followed the 30 signs on a short stretch in both directions: it displayed 30, as the video confirms, and drove 26 to 31 km/h (GPS). This is an incidental observation, not a scored result.



15b, zone entry: the zone 30 sign (F4a) at the right-hand edge, beyond the cycle lane; school markings on the road; the car displays 50 at 39 km/h. Number plates blurred.



15b, zone end: C43 50 with the end-of-zone sign (F4b) below it; the car displays 50 at 43 km/h. Number plates blurred.

Home zones in Brussels. The three Brussels home zones driven on 18 October behaved as in July: weB06 and weB07 displayed 20, weB08 displayed 30 and was held below 20 only by the width of the street. At Terdelt the car displays 30 on Gilisquetlaan, which is correct because Gilisquetlaan is not part of the home zone; a home-zone and one-way sign at that corner is rotated by about 90 degrees and faces the main road, which makes Gilisquetlaan look like the home zone. The garden quarter itself (weB05) was not driven, so weB05 is not tested.

Lambermontlaan. The parallel cycle route described by johanna.be was blocked off and could not be driven. A short home zone next to it was handled correctly (20).

Laeken. On 15a and 15b the zone 30 signs are small and placed on the right of a wide two-lane road; driving in the left lane, the car did not register them in either direction and displayed 50, as in July. At the johanna.be arrows for 14a and 14b the street is now signed 50 in both directions, so these two segments are void. On the way between them, outside the johanna.be locations and not scored, four unsigned streets (Leopold I-straat, Kroonveldstraat, Chrysantenstraat, Kunstenaarsstraat) displayed 50; all four are 30 in the Brussels Mobility layer, which is consistent with the same map-data problem as on Nieuwpoortlaan.

Wemmel: zone signs read as single signs. On Isidoor Meyskensstraat (F03) the car recognised the zone 30 sign and displayed and drove 30 up to the roundabout. After the roundabout, on Diepestraat (F04), it reset to 50 although the zone continues, and kept 50. A second pass reproduced this at the same roundabout. The F4a zone plate carries a C43 roundel and the word ZONE; the car appears to read only the roundel, as a stand-alone limit that ends at the next junction. The same happened on Prins Boudewijnlaan (not in the johanna.be set), where the car displayed and drove 50, then changed to 30 only some distance after the zone sign. By contrast, a 50 that comes from map data is kept across junctions. This is the same pattern as the cycle-street limit on 11 October.

Wemmel: home zones. weF01 and weF02 displayed 50 in a 20 home zone, as in July; driven speed stayed low (about 25 and 9) because of the street layout. weF03 displayed 30 and drove 30. For weF03 the official data conflicts with johanna.be: the AWV derived speed layer has J. Vanden Broeckstraat as zone 30 and 50, not as a home zone.

Official data in Wemmel. The AWV derived speed layer, joined to Wegenregister street names, shows J. De Ridderlaan (weF01) and Steenweg op Merchtem / Kerkstraat near Sint-Servaaskerk (weF02) correctly as home zones (20, F12a), so for those two the official data is right and the car's map data is not. For Isidoor Meyskensstraat it lists most of the street at 50 (built-up area) and only one segment at 30, so the official layer also misses most of that zone, and the car is left with the sign alone. Prins Boudewijnlaan is 30 (F4a) in the AWV layer.

Koekelberg and Ganshoren. Emile Bossaertlaan (12a, 12b) is an unsigned stretch, so the Brussels default of 30 applies, and the Brussels Mobility layer has it at 30. The roads before and after it are signed 50. The car displayed 50 in both directions and drove 50, as in July; surrounding traffic drove it at 50 as well. The road is a dual carriageway with a central reservation, separate cycle paths and footpaths, and signal-controlled junctions, and nothing on the road marks the change from 50 to 30 and back. It cannot be told from this run whether the car's 50 comes from its map data or is carried over from the preceding 50 sign. The unsigned area in front of the Basilica, narrow and busy with parked cars, also displayed 50 (an incidental observation outside the johanna.be locations, not scored). On Keizer Karellaan (13a), a very short signed zone 30, the car displayed 30 for a moment after the sign and then 50 about 20 m into the zone, on both passes; Brussels Mobility has the stretch at 30. From the Nationale Glorielaan approach the zone sign is not visible. At the end of the zone the rectangular end-of-zone plate was recognised, but shown on screen as a round end-of-limit sign, which again suggests the car reads only the roundel printed on zone plates.

Behaviour. The car braked for a pedestrian crossing outside a crosswalk who was not in its path, and stopped for pedestrians waiting at the roadside where there was no crossing. Both are cautious rather than wrong.

Flanders (johanna.be observations, for comparison)

Segment	Location	johanna.be observation	This study
F01	Bertem, Bosstraat (Vuikelaan to Tervuursesteenweg)	Observed and respected 30; displayed 50 through the whole zone	4 Oct: drove 30 in both directions; displayed limit not visible on video
F02	Zaventem, Steenokkerzeelstraat (Groenstraat to Heidestraat)	Observed, respected and displayed 30; missed zone end at roundabout	4 Oct: correct, southeast to northwest; slowed to 30 after the zone sign and held it up to the roundabout (front camera)
F03	Wemmel, Isidoor Meyskensstraat	Displayed 50 (once 51), respected 30	18 Oct: correct, 30 up to the roundabout (2 passes)
F04	Wemmel, Diepestraat	Displayed 50, drove 34	18 Oct: 50 displayed after the roundabout, up to 31
F05	Wemmel, Steenweg op Brussel (Vanderzijpen to roundabout)	Horizontal and vertical signage	18 Oct: driven in full, north to south; 50 displayed, up to 31; no 30 sign seen
F06	Wemmel, Maalbeeklaan	No detail recorded	Not driven

Speed offset test

Not tested in a structured way (see Methods). One observation on 4 October: on a 70 km/h road, raising the maximum speed setting to 110 km/h left the driven speed at 68 km/h (speedometer).

Cycle streets

Location	Displayed limit (km/h)	Segment speed (km/h)	Overtaking attempts	Aborted by driver	johanna.be (July)
Winksele, Warotstraat	4 Oct: 50, behind a cyclist at about 30. 11 Oct: 30 at the entry; in one direction lost after a crossing (31, 32, then 50)	up to 33 (4 Oct); about 29 (11 Oct)	Yes, in both directions (at least one cyclist each way, from video)	No	4 attempts on one cyclist
Winksele, Klein Dalenstraat	11 Oct: 30 at the entry, 50 after a crossing, both directions	21 to 30	Not tested (no cyclists)	n/a	Attempts on 2 cyclists
Kortenberg, Kerselarenstraat	11 Oct: 50 throughout, both directions; 4 Oct: 50 at the entry	up to 40	No (narrow road)	n/a	Displayed 70, drove 42
Lambermontlaan; Van Ingelgomstraat; Avenue de Nivelles	Not tested	Not tested	Not tested	Not tested	See the table of locations

4 October. On Warotstraat in Winksele (C01), the vehicle displayed 50 instead of 30 (confirmed on video, 09:53), but drove 30 to 33 and did not overtake the cyclist ahead. That cyclist rode close to 30 km/h, so this does not test the overtaking rule; a run behind a slower cyclist is still needed.

11 October (firmware 2026.33.100). On Warotstraat the car displayed 30 at the entry. In one direction it lost the limit after a crossing and missed the repeat sign (31, 32, then 50), while still driving about 29. Behind slower cyclists it overtook them. In the other direction it held 30 throughout but did not treat the street as a cycle street: with a cyclist ahead and an oncoming car it waited, then overtook in the stretch between a crossing and the next cycle-street sign. The driver let that overtake complete, so whether the car would have overtaken inside the posted stretch was not tested on that pass. On Klein Dalenstraat the car showed 30 from the entry but reset to 50 after a crossing with two side streets, in both directions, while driving 21 to 30; no cyclists were present. A navigation waypoint in the middle of the street was ruled out as the cause, because the return pass reset at the same crossing. On Kerselarenstraat the street was not recognised as a cycle street in either direction; the car did not overtake, but the road is narrow, so this says little about rule knowledge.

The 30 on the cycle-street entry sign is informative: on a cycle street the 30 km/h limit and the ban on overtaking cyclists follow from the F111 sign itself. The car appears to read the number and to treat the cycle street as a single sign rather than as a zone that continues until the F113 end sign, which explains both the reset at intersections and the overtaking.

Home zones

Location	Displayed limit (km/h)	Segment speed (km/h)	Free flow	johanna.be (July)
weB03 Dumonplein, northbound	30	30; 14 among pedestrians	not recorded	Displayed 30, drove 25
weB04 Dumonplein, southbound	30	30	not recorded	Displayed 30, drove 25
Schaerbeek home zone, 4 Oct (location not confirmed; not scored)	20	20	not recorded	Correct in both candidates (20 / 17 and 20 / 12)
weB01 Nieuwland (11 Oct)	30	17 (set by street width)	No (pedestrians in the road)	Displayed 30, drove 18
weB02 Kazernestraat (11 Oct)	30	18 (set by street width); steering intervention at the start	No (pedestrians in the road)	Displayed 30, drove 19
weB07 René Declercqstraat (18 Oct)	20	15	not recorded	Displayed 20, drove 18
weB08 Jean Deraeckstraat (18 Oct)	30	under 20 (set by street width)	not recorded	Displayed 30, drove 16
weB05 Terdelt garden quarter (18 Oct)	Not tested	Not tested	Not tested	Displayed 20, drove 17
weB06 Arthur Rolandstraat (18 Oct)	20	10	not recorded	Displayed 20, drove 12
weF01 J. De Ridderlaan, Wemmel (18 Oct)	50	about 25	not recorded	Displayed 50, drove 28
weF03 J. Vanden Broeckstraat, Wemmel (18 Oct)	30	30 (AWV data: zone 30, not 20)	not recorded	Displayed 30, drove 29
weF02 Steenweg op Merchtem, Wemmel (18 Oct)	50	9 (set by street width)	not recorded	Displayed 50, drove 23

Status of each johanna.be finding

johanna.be finding (July 2026)	Re-tested here	Result
Speeding in 55% of Brussels 30 km/h segments	Yes	Partly. Wrong limit displayed on every unsigned default-30 segment (17a, 18a, 8a, 8b, 12a, 12b); speed above 30 recorded on 17a, 18a, 8b, 12a (35 km/h in stop-and-go traffic) and 12b. Also where signs were missed or a zone was dropped (13a, Diepestraat in Wemmel). Not on most signed segments where the sign was recognised. No Brussels-wide figure can be derived from either sample
Wrong displayed limit in about 90% of segments	Yes	Partly: most signed zones display 30 once the sign is seen; default-30 segments display 50; most home zones display 30 or 50 instead of 20; 10a showed 20 instead of 30

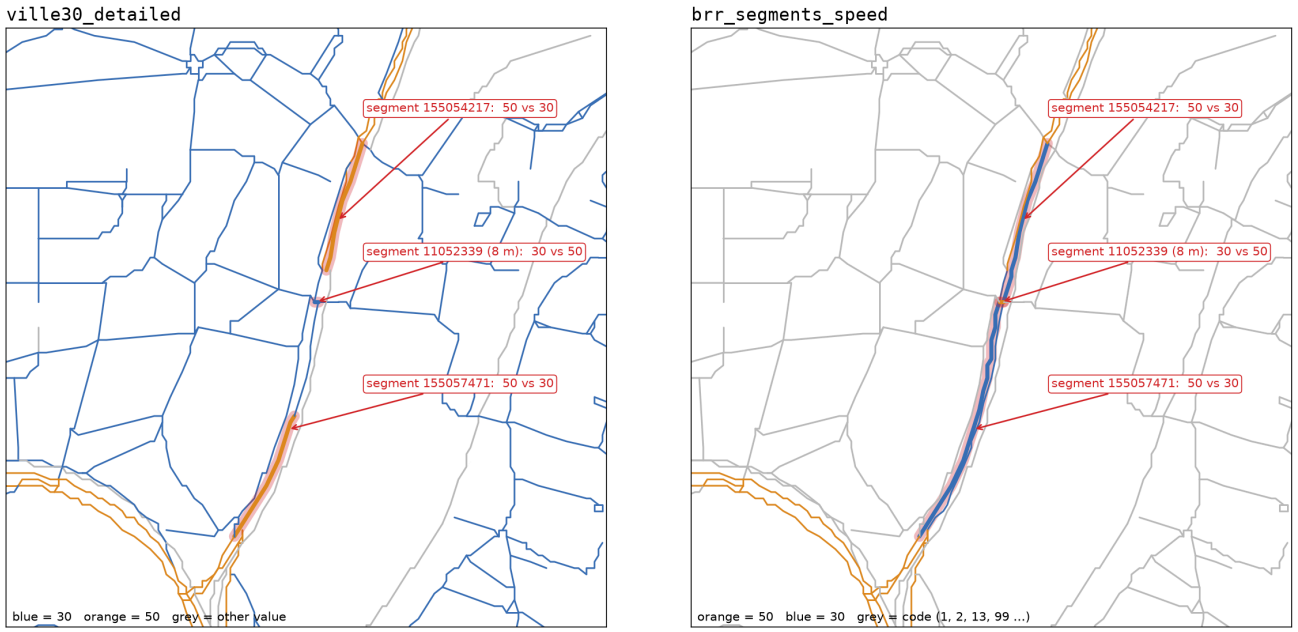
johanna.be finding (July 2026)	Re-tested here	Result
Signed F4a zone observed but not applied	Yes	Mostly not reproduced: on most signed segments a recognised sign was applied for the whole zone. On 3a (4 Oct), 13a and Diepestraat (F04, 18 Oct) a recognised 30 was dropped back to 50 inside the zone. Signs were also missed (3a and 3b on 4 Oct; 11a, 11b on 11 Oct; 15a, 15b on 18 Oct)
Default 30 segments without signs	Yes	Still fails on every run: 50 displayed on 17a, 18a, 8a, 8b, 12a and 12b; up to 44 km/h on 17a (11 Oct) and 50 on 12b (18 Oct)
Home zones: speeding in 42%, wrong limit in 67%	Yes (10 of 12)	Mixed: weB06 and weB07 display 20, as in July; Dumonplein (weB03, weB04), the Marollen (weB01, weB02) and weB08 display 30; in Wemmel weF01 and weF02 display 50 (official data: 20) and weF03 30 (official data: zone 30). Low speeds mostly follow from street layout. weB05 and weW01 (Wallonia) not tested
Cycle streets: no correct 30 km/h, overtaking attempts	Yes	Confirmed on 11 Oct: limit lost after intersections on both Winksele streets, and cyclists overtaken on Warotstraat
ISA gives no warning during FSD	No	Not tested
Lowering speed is harder than raising it	No	Not tested in a structured way
Braking to disengage releases steering torque	No	Not re-tested for safety reasons
Courteous behaviour towards pedestrians and cyclists	Observed	Confirmed; two cautious stops for pedestrians away from a crossing (18 Oct)

Brussels speed-limit data

The Brussels regional 30 km/h rule is not explicitly present in any public dataset, and the official layers contradict each other on the tested axes.

Two official layers, two answers. Brussels Mobility publishes two speed layers on the same UrbIS road segments via its GeoServer [12]: `ville30_detailed` and `brr_segments_speed`. Joined on segment id, 414 segments across the region are 30 in the first and 50 in the second (download of 24 November 2026). On the Woluwelaan the two layers disagree in both directions: segment 11052339 is 30 versus 50, while segments 155054217 and 155057471 are 50 versus 30, the only two segments in the region where it goes that way (Appendix C).

Same road segments, two official speed layers (Brussels Mobility GeoServer). Red halo: the layers disagree on the same segment (labels: ville30_detailed vs brr_segments_speed, km/h).



Source: data-mobility.irisnet.be/geoserver/wfs, layers bm_network:ville30_detailed and bm_network:brr_segments_speed, joined on urbis_id, downloaded 24 November 2026. Sint-Pieters-Woluwe.

Same road segments on the Woluwelaan in two official Brussels Mobility speed layers, ville30_detailed and brr_segments_speed. Blue is 30 km/h, orange is 50 km/h, grey is another value. A red halo marks segments where the two layers disagree. Downloaded 24 November 2026.

The two Woluwe default-30 segments.

Location	Brussels Mobility	OpenStreetMap
Connector Tervurenlaan to Woluwelaan, 50.83272 N 4.43266 E (17a)	The connector itself (11052892): 50 in both layers, although no sign sets 50 there and the regional default (F1, no other sign) gives 30	30, source: Brussels regional rule
Woluwedal, parallel local road, 50.84693 N 4.43946 E (18a)	Segment 155059872: 30 in one layer, 50 in the other. Local road: no value, or code 13. A 50 km/h main road lies 14 m away	50, source: sign

Undocumented codes. The `speed` field in `brr_segments_speed` mixes km/h values with codes such as 1, 2, 13 and 99, which makes reuse error-prone. Across the Brussels test segments checked, `brr_segments_speed` gives 50 km/h on 12 segments where `ville30_detailed` gives 30, including 17a and 18a; on the other segments it gives code 1, which seems to stand for 30 km/h but is not documented. Home zones are not encoded at all: at the eight Brussels home zones (weB01 to weB08), `ville30_detailed` gives 30 km/h instead of 20, and `brr_segments_speed` only codes 1 or 2. OpenStreetMap, by contrast, tags all twelve home zones as living streets with a 20 km/h limit [13].

National access point. On transportdata.be [11], only Flanders delivers speed limits in a structured way: Agentschap Wegen en Verkeer has run a TN-ITS service since 2016, with daily updates. Brussels is listed only with a general link to its data portal. Wallonia lists nothing on speed limits. A map provider therefore has no structured source for the Brussels default. The Flemish data is far richer: the Agentschap Wegen en Verkeer publishes derived speed regimes per road segment, including the sign that determines the limit, and separate layers for zones 30, home zones and cycle streets [16]. Both Winksele cycle streets are encoded as 30 km/h (F111), and the Wemmel home zones weF01 and weF02 as 20 km/h (F12a). For weF03 (J. Vanden Broeckstraat) the AWV layer gives zone 30 and 50, not a home zone, which conflicts with the johanna.be listing. This cuts both ways: in July, FSD displayed 50 km/h in Wemmel home zones that the

official Flemish data, and OpenStreetMap, record as 20 km/h. Correct source data alone did not prevent the error there.

Discussion

The results confirm part of the johanna.be findings and show that the rest has improved, with the same FSD version.

What is confirmed. On streets where the Brussels regional default applies without a sign, the vehicle applied 50 km/h, as in July. johanna.be's "default 30" subgroup showed the same pattern.

What has changed. On most signed zone 30 segments, the vehicle now applies the 30 km/h limit for the whole zone once it recognises the sign. On three segments a recognised 30 lasted only briefly before the car returned to 50 inside the zone: 3a (4 October), 13a and Diepestraat in Wemmel (F04, 18 October). In July, johanna.be saw the limit observed but then overridden by a displayed 50 km/h in most segments. What remains on signed segments is recognition: small signs, lane position or sun angle may cause a sign to be missed (3a/3b on 4 October, 11a and 11b on 11 October, 15a and 15b on 18 October).

Likely causes of the change. The FSD version is identical in both tests, so the neural network itself is unlikely to explain the difference. Plausible explanations, not proven:

- updated map data in the vehicle since July;
- changed signage (segment 3b gained an F4a sign after July);
- vehicle or camera differences between Model 3 and Model X;
- firmware updates between runs (2026.21.100 in July, 2026.27.300 on 30 September and 4 October, 2026.33.100 on 11 and 18 October), with FSD unchanged at 14.2.2.6.

Why the default-30 rule fails. A vehicle cannot remember an F1 sign at the region's border for kilometres. It must either know the rule or get it from map data. The public data does not carry it explicitly, and a main road recorded as 50 km/h often lies within metres of the local road. Map-matching to the wrong carriageway may add to the problem.

Old zones correct, new default missing. The car's map data appears correct on zone 30s that Brussels signed before the regional default took effect in 2021, and wrong on arterial stretches whose 30 km/h follows only from the regional rule. Two observations support this: zone 30 signs remain in place on roads where the regional rule makes them legally redundant (for example on divided roads with two lanes each way), and the car applies 30 there reliably, but applies 50 on comparable unsigned stretches. If correct, the Brussels default never made it into the map data the car uses, and fixing it requires the default to be published explicitly, segment by segment.

Cycle streets need a zone, not a sign. The cycle-street failures look different from the speed-limit failures. The car reads the cycle-street entry sign, including the informative 30, but does not keep the cycle-street regime after an intersection and does not apply the ban on overtaking cyclists. That is behaviour, not map data: even perfect data would not stop an overtake if the software does not know the rule.

Zone plates are read as single signs. The Wemmel zone (F03 and F04), 13a and Prins Boudewijnlaan fit one explanation, which remains a hypothesis: the car's map data is the base layer and signs override it locally. Where the map data already holds the zone (most signed zones in Brussels), a recognised sign and the map agree and the 30 holds. Where the zone is missing from the map data (Isidoor Meyskensstraat),

the car has only the sign, reads the C43 roundel on the F4a plate as a stand-alone limit, and returns to the map's 50 at the next junction or roundabout. A 50 from the map, by contrast, is kept across junctions. The plate's rectangular shape and the word ZONE do not appear to be used; on 13a the rectangular end-of-zone plate was shown on screen as a round end-of-limit sign. Two fixes follow: treat F4a, F111 and F12a as zone starts that hold until the matching end sign, and keep map data current with the official layers, which in Wemmel already contain the home zones the car misses.

Responsibility. Poor source data does not absolve the manufacturer. A system that does not know the Brussels regional rule is incomplete for Brussels. OpenStreetMap encodes the rule correctly at 17a, and the Brussels Mobility layer gives 30 on several other failing segments, which shows that correct data exists.

Displayed limit versus driven speed. johanna.be reports both measures; the runs here show how far they diverge. A wrong displayed limit often coexisted with a correct driven speed (F01 in July; one cycle street and the second westbound pass on Paul Hymanslaan on 4 October). Actual overspeed was recorded on the unsigned default-30 segments (17a, 18a, 8b, 12a at 35 km/h in stop-and-go traffic, and 12b), the Dumonplein home zone, one eastbound pass on Paul Hymanslaan (45 km/h), 13a (44 km/h after the zone was lost), 15b (43 km/h), 15a (34 km/h GPS), 11b (35 km/h GPS), Kerselarenstraat (up to 40 km/h in a cycle street), and Prins Boudewijnlaan in Wemmel (50 in a zone 30). Perception and yielding worked independently of the displayed limit: the vehicle slowed for pedestrians in every case observed, down to 14 km/h among pedestrians at Dumonplein. This mitigates the risk of driving above the limit but does not remove it, since stopping distance grows with the square of speed.

Speed offset. Not tested in a structured way (see Methods); the author's experience is reported in the Author's assessment.

Limitations and conflict of interest

This is a small, single-vehicle replication by an FSD user, and should be read as such.

- **Sample size.** 45 johanna.be locations and 61 scored runs on three filmed days (4, 11 and 18 October), plus a preliminary run on 30 September. Not enough for frequency claims across Brussels.
- **Coverage and scope.** Testing is closed. Not tested: F06 Maalbeeklaan in Wemmel (not reached), home zone weB05 (Terdelt, only Gilisquetlaan driven), the cycle streets Van Ingelgomstraat (not reached) and the Lambermontlaan side road (closed for roadworks), and Wallonia (W01 to W04, home zone weW01 and the Avenue de Nivelles cycle street in Rixensart). F05 Steenweg op Brussel was driven in full, but no 30 sign was found on it. 14a and 14b are void: the street at the johanna.be arrows is now signed 50.
- **Locations.** The original report published Brussels segments only as numbered arrows on a map. They were placed from that map and Brussels Mobility data and checked on site; placement errors remain possible.
- **Video.** The 30 September run was not filmed by the author; the scored results rest on the filmed runs of 4, 11 and 18 October, whose raw video is available on request. The 11 October results for 6b, 7b and 8b were recorded from the driver's account after the run. F02 (4 October) was checked on the car's front camera, because the dashboard was not in view.
- **Sample selection (both studies).** Neither sample is random. Percentages describe the selected locations, not FSD in Brussels in general.
- **Firmware.** 2026.27.300 on 30 September and 4 October, 2026.33.100 on 11 and 18 October; FSD 14.2.2.6 in all runs of both studies. Results are reported per run and not pooled across firmware versions.

- **Conditions.** Weekday (30 September), Sunday morning (4 and 18 October) and Sunday afternoon with heavy congestion (11 October); schools were closed on the Sundays. Displayed limits do not depend on traffic, but driven speed does: many 11 October runs were not in free flow. Interaction with pedestrians near open schools was not tested.
- **Protocol deviations.** On Warotstraat the overtakes were completed rather than aborted before the vehicle was alongside the cyclist; not every cycle street could be driven both behind a cyclist and in free flow; on weF01 the driver intervened for navigation, not safety; no structured speed-offset test was run.
- **Conflict of interest.** The author uses FSD daily and supports its availability in Europe, provided it complies with local rules. To limit bias, all runs are reported including failures, and raw video of the filmed runs is available on request.

Conclusions and recommendations

The remaining speed-limit failures are fixable, and the fixes lie with both Tesla and the Brussels region.

Conclusions

1. **Signed zone 30.** On most signed zone 30 segments FSD v14.2.2.6 applied 30 km/h for the whole zone once it recognised the sign. In July the displayed limit was correct on 1 of the 7 Woluwe segments that were signed in July (3b received its F4a later); in October it was correct on most of them. The July failure mode did still occur on three segments, where a recognised 30 lasted only briefly (3a on 4 October; 13a and Diepestraat in Wemmel (F04) on 18 October). Small signs were sometimes missed (3a and 3b on 4 October, 11a and 11b on 11 October, 15a and 15b on 18 October).
2. **Brussels default 30.** On unsigned streets under the Brussels regional default, FSD displayed 50 km/h on every run: 17a, 18a, 8a, 8b, 12a and 12b, with speeds up to 44 km/h on 17a and 50 on 12b (speedometer). The system does not appear to know the regional rule. Brussels' public data does not encode it consistently, but on several of these segments the Brussels Mobility layer already gives 30.
3. **Cycle streets.** Not resolved. On both Winksele cycle streets the car lost the cycle-street limit after intersections, and on Warotstraat it overtook cyclists. The cycle street appears to be treated as a sign rather than a zone; the ban on overtaking is a rule the software must apply, whatever the map data.
4. **Home zones.** Mixed. Two of the seven Brussels home zones tested displayed 20 (weB06, weB07), as in July; Dumonplein, the Marollen and weB08 displayed 30. In Wemmel two home zones displayed 50 although the official Flemish data has them at 20. Where speed stayed low, it was mostly the street layout. The car yielded to every pedestrian.
5. **Speed offset.** Not tested in a structured way.
6. **Overall.** The remaining issues are specific and reproducible: the Brussels default, zone signs that are not held, missed small signs, cycle streets and home zones. Both studies found FSD careful and courteous towards pedestrians and cyclists. The author's view on what this means for the approval is given in the Author's assessment.

Recommendations

To	Recommendation
Tesla	Encode the Brussels regional default (30 km/h unless signed otherwise) and give an observed lower limit priority over map data

To	Recommendation
Tesla	Interpret the F4a sign as the start of a zone valid until the matching F4b end sign, not as a single limit that ends at the next junction
Tesla	Treat a cycle street (F111) and a home zone (F12a) as a zone valid until its end sign, across intersections, including the ban on overtaking cyclists in cycle streets
Brussels Mobility	Publish one authoritative speed-limit layer, with the regional default explicit on every segment and documented codes
Brussels Mobility	Deliver that layer to transportdata.be via TN-ITS, as Flanders does
RDW and Belgian authorities	Include region-specific default rules in the post-approval monitoring of FSD and similar systems
Map providers	Verify Brussels speed limits against the regional default rather than the national built-up-area default

Author's assessment and advice

This section gives the author's personal view, separate from the measured results above; in the author's view, revoking the approval would be disproportionate.

- **The system is being corrected.** Between July and October, behaviour on signed zone 30s improved markedly without a new FSD version, so the overall system, including its map data, appears to have improved over time, although the cause cannot be isolated. Precisely reported issues can be expected to get fixed.
- **Careful, defensive driving.** In both studies FSD drove carefully and yielded proactively to pedestrians and cyclists, including to road users without right of way. During the 30 September run, those in the car saw pedestrians wave a thank-you to the vehicle four times, a sign that its yielding was noticed and appreciated. In the author's experience this driving style is more considerate than that of many human drivers, and it does not put unaware road users at risk through aggressive behaviour.
- **On revocation.** The recommendation to revoke appeared disproportionate in July and appears more so now for signed zones, given the measured improvement between July and October. The remaining issues (the Brussels default 30, zone signs not held, missed small signs, cycle streets and home zones) are specific and fixable. Revocation would remove a system whose behaviour towards vulnerable road users both studies describe as courteous, without fixing those issues any faster. Dated conditions with an independent re-test would.
- **Standard of comparison.** FSD is judged against strict compliance that much of the traffic around it does not meet; on every test day, surrounding traffic regularly overtook the vehicle in zone 30. Tesla has published its own data claiming that FSD speeds roughly match surrounding traffic [14]. The same standard applied to human drivers would disqualify a large share of them. A higher bar for automated systems is defensible, since one systematic flaw affects every vehicle at once, but that argues for targeted fixes, not withdrawal.
- **Speed offset.** No structured test was run. In about 16,000 km of daily FSD use with a +10% offset, the author has found it hard to make the car drive above the limit with the offset alone: the system usually settles at the speed limit and only on wide roads reaches the raised ceiling. In a single observation on 4 October, raising the maximum speed to 110 km/h on a 70 km/h road left the driven speed at 68 km/h. On 30 September and again on 4 October the test vehicle was among the slowest in zone 30 traffic and was regularly overtaken, on 30 September even by cyclists (observed by those in the car). A system

that strictly applies limits that surrounding traffic does not respect risks not being used, and then delivers none of its safety benefits. That argues for credible, consistent limits and signage, not for letting the system exceed them by default.

- **Infrastructure and limits.** Some zone 30 stretches, such as the Woluwelaan (two lanes each way, a central reservation, a separate tram track, cycle paths, and signal-controlled crossings), are designed like through roads. Nearby the pattern is even inverted: the main road with signal-controlled crossings is 30 km/h, while a smaller side road with only a zebra crossing is 50 km/h. Such limits often follow from rules set at several levels, such as the mandatory zone 30 around schools [4], which the road authority must apply whatever the road's design. Where road design and speed limit conflict, compliance by human drivers suffers as well. Aligning them is a task for the road authority, alongside fixing its speed-limit data.
- **How the default is communicated.** The Brussels default of 30 exists in law but is not communicated on the road or in machine-readable data. Belgian law already offered a visible way to lower the limit for a whole area, a zone 30 sign at each entrance; instead the meaning of the built-up area sign (F1) was changed for one region, which visitors, map suppliers and vehicles cannot see. The result is inconsistent: some 30 stretches carry zone 30 signs the law makes redundant, while others, such as Emile Bossaertlaan, an unsigned 30 stretch between two signed 50 roads, carry none, and traffic drives them at 50. A limit that is meant to be followed, by people or by automated systems, has to be signed and published as data.

Acknowledgements

The author thanks Geert van Waeg (johanna.be) for sharing the test locations and for respecting the independence of this replication. Their input does not imply endorsement of this report's content or conclusions.

Appendices

- **A.** Segment list with coordinates and directions (spreadsheet published with this report)
- **B.** Full test log per run (spreadsheet published with this report)
- **C.** Comparison image: `ville30_detailed` versus `brr_segments_speed` on the Woluwelaan (image)
- **D.** Data queries used: Brussels Mobility GeoServer WFS, Flemish AWV WFS and OpenStreetMap Overpass requests, with the scripts that ran them (queries, scripts)
- **E.** Video index: file names and timestamps per segment (spreadsheet published with this report)

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