

GTR EVS Phase 1 – Egress Time – Presentation for SIG meeting #2

CSTA 6 – 15/12/2023

GTR EVS Phase 1 – Reminder:

EVS-GTR EVS TF5 Supplement Material – Japan / Korea / China:

<https://wiki.unece.org/download/attachments/30540161/EVSTF-08-57e.pptx?api=v2>

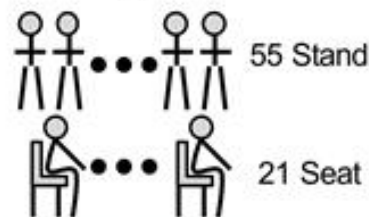
Evacuation time for a bus

Selected Criteria:

- No external (outside the pack) fire or explosion in [5 minutes] after the warning signal occurring, the test passes.



- Evacuation test for 12m-length shuttle bus :



No.	Evacuation time
1	4min 05s
2	4min 24s

No.	Evacuation time
**	
1	2min17s

12 Evacuation time: from warning signal triggered to every passenger escape to 5m away from the bus.



100615 - Human
tors Issues in Moto

<https://wiki.unece.org/download/attachments/35782675/EVSTF09-26-TF5-14.docx?api=v2>

Comment in the document: The time duration for this condition needs to be data-driven. For buses, other sources [for example, Human Factors Issues in Motorcoach Emergency Egress – Year 2. John K. Pollard and Stephanie H. Markos. U.S. Dept. of Transportation, NHTSA Report, December 2009.] provide further support that 5 minutes is appropriate. For passenger cars, in addition to the data presented from China showing less than 2 minutes for evacuation, a time duration of 2 minutes has been accepted as sufficient duration to allow vehicle exit in the context of fuel tank testing (ECE R34).

Following tests: “These results indicate **that evacuation of a motorcoach passenger could be achieved using any of these exits in less than three minutes**”

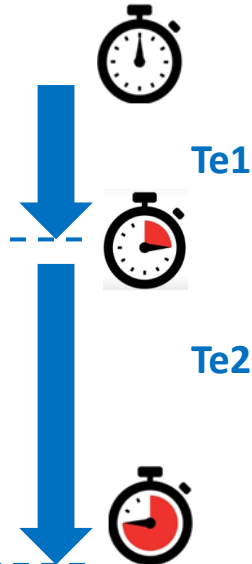
GTR EVS Phase 1 – Requirements for egress time

Time for egress (Te) definition:

- This « **Time for egress** » as an alternative of the 5min has to be performed regarding the vehicle family definition;
- Time for egress (**Te**) should be divided into 2 different Times regarding criteria:
 - **Te1**: time for the first door open
 - **Te2**: time for all passengers out of the vehicle
- In case of battery manufacturer conducting the test for type approval, the test can be performed with the 5min or with the **Te1 and Te2** specified by the car manufacturer corresponding to the vehicle;

Following test procedure:

- Following this test procedure: drive at 70 km/h speed
- Start the time = assume that dashboard warning lights up
- Stop the vehicle at the side of the road after 800m
- Driver gets out, opens cargo area, takes out and unfolds the wheelchair
- Rolls wheelchair to passenger side door
- Opens passenger side door and helps disabled person to sit into wheelchair
- Driver pushes wheelchair 15m away from vehicle
- Driver picks up the baby in its chair and take it away 15 m from vehicle...
- Stop time.



Vehicle categories:

- **Te1** could be common to all vehicle families
- **Te2** max to be used on the same vehicle family (VU, VP 5pl, VP 7pl)

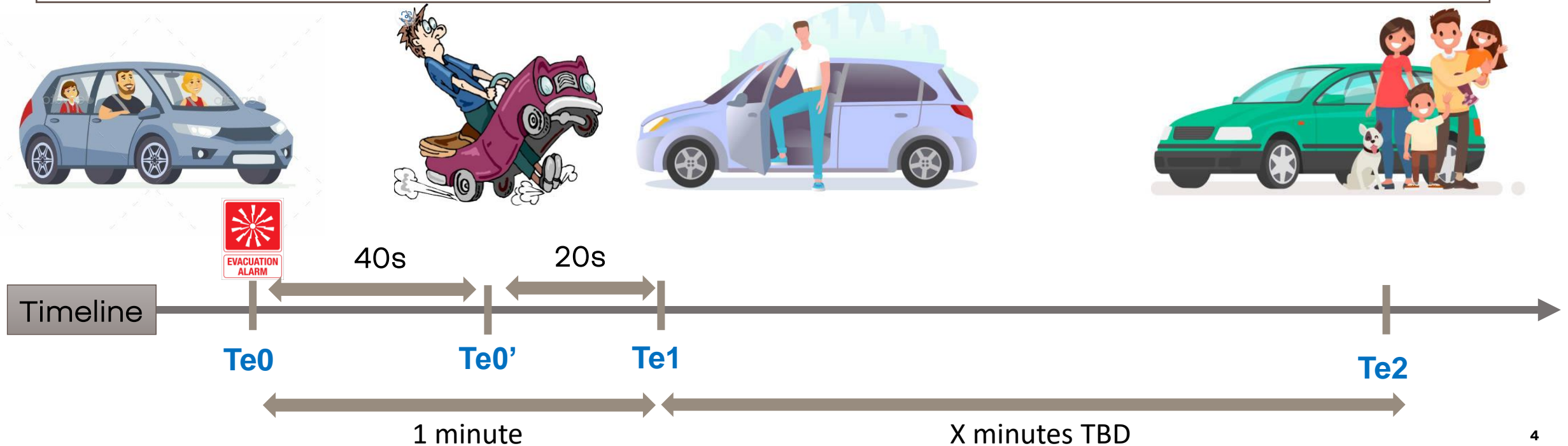
GTR EVS Phase 1 – Requirements for egress time:

Time for egress (T_e) should be divided into 2 different Times regarding criteria:

- T_{e0} : time for driver warning
- $T_{e0'}$: time for allowing driver deceleration
- T_{e1} : time for the first door open
- T_{e2} : time for all passengers out of the vehicle

Criteria to be compliant:

- Criteria from T_{e0} to T_{e1} : no smoke / no fire / no explosion
- Criteria from T_{e1} to T_{e2} : no fire / no explosion



Test process for evacuation

Evacuation steps linked to Te2:

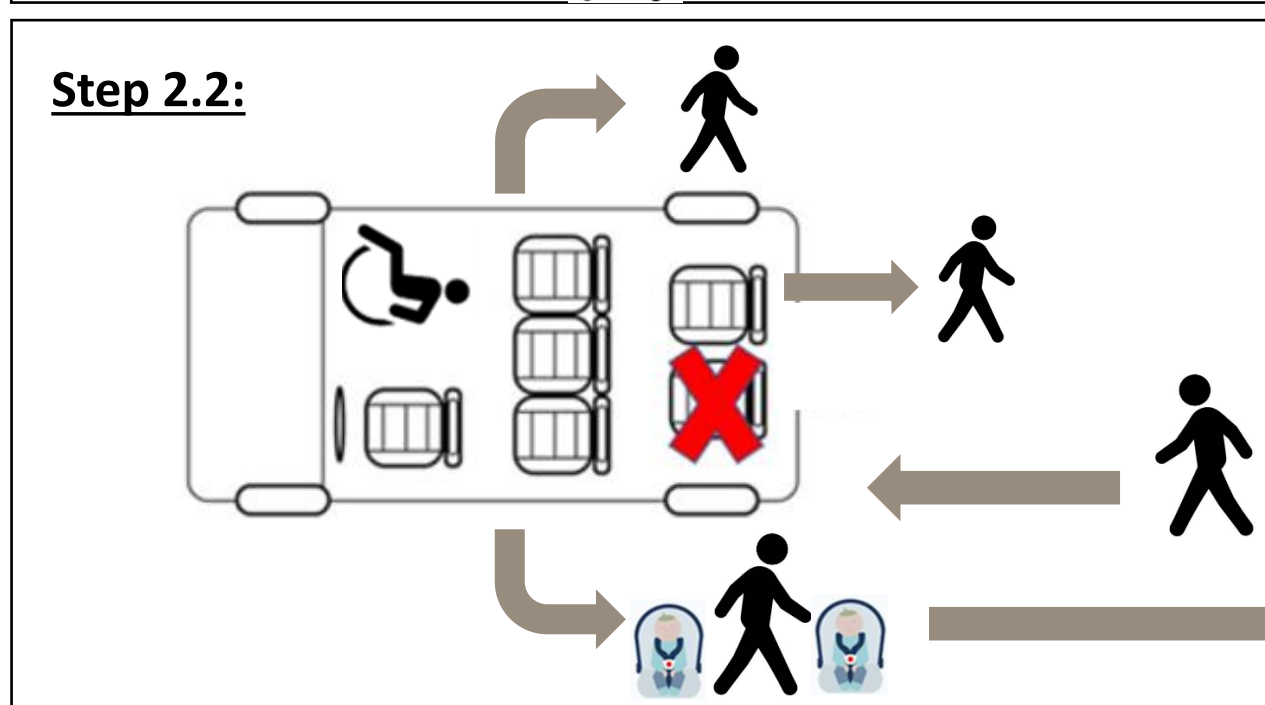
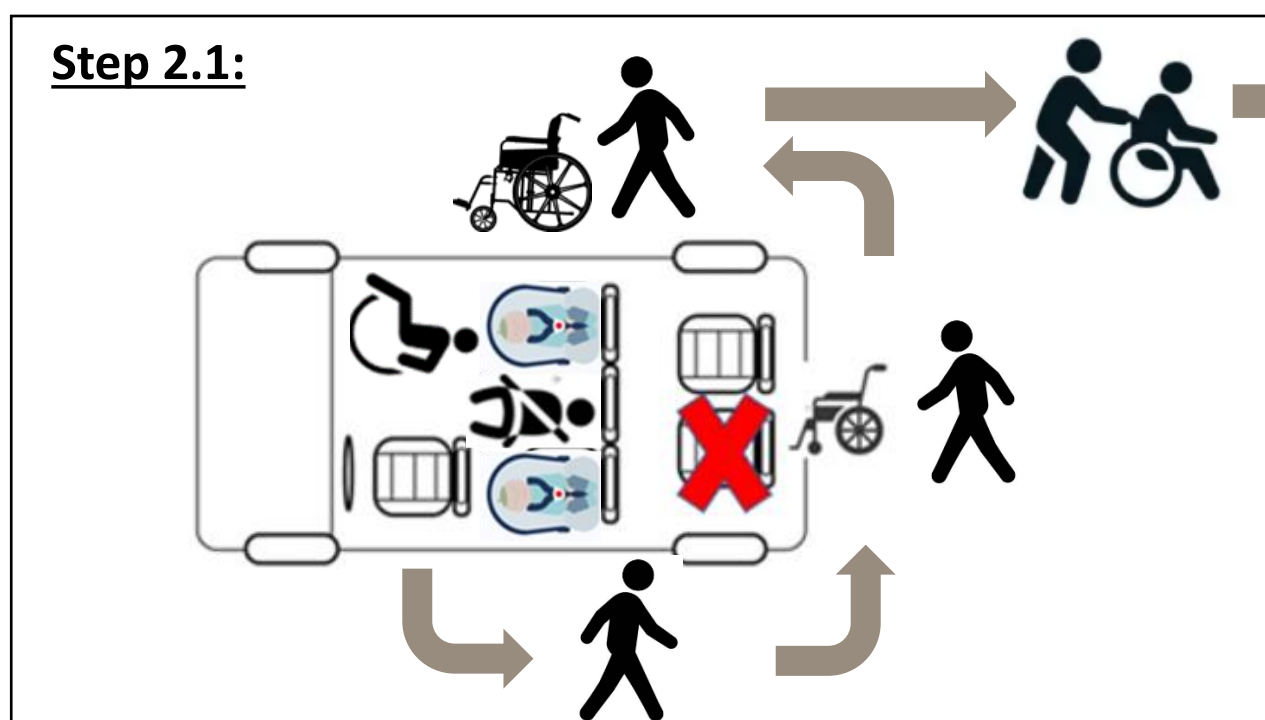


1. **Step 2.1:** Driver gets out to bring the wheelchair to the PRM and rolls him out to the safe area (walking)
2. **Step 2.2:** Driver gets back to evacuate the babies with the baby-seats while the 2 other persons evacuate by themselves (walking)



Stop evacuation criterion Te2:

- The stop evacuation criterion is when everybody is in the safe area (15 meters away from the car)
- For the other vehicle configuration, use the same step process of evacuation

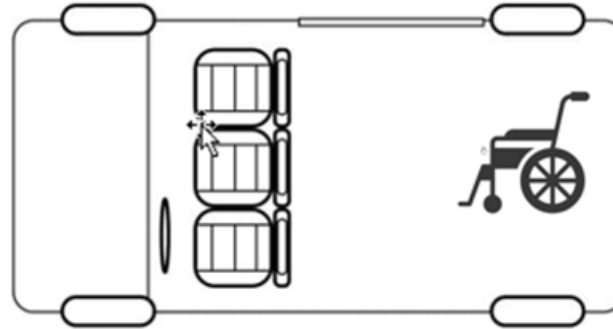
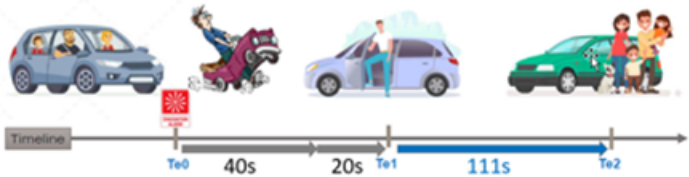


Safe area:
15 meters away
from the vehicle

1st Assessment: Stellantis test results

Action plan to define other te2 for different car configurations

- Van (*Professional Van only one row used*)
Scenario considered



Involved passengers scenario



Driver

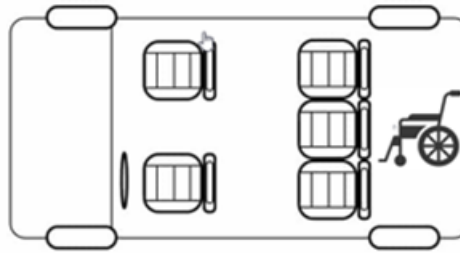
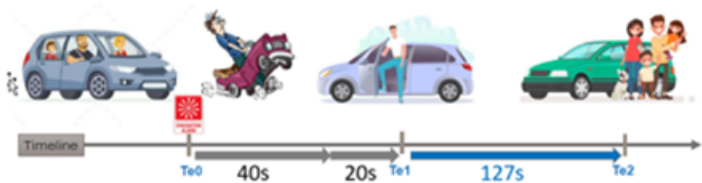


Passenger



Baby in chair

- Hatchback / Station Wagon (*5 places*)



Involved passengers scenario



Driver



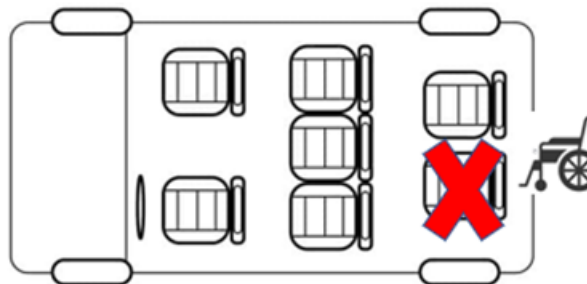
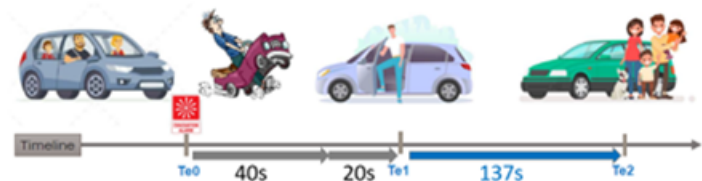
Passenger



2 Baby in chairs



- Family car (*7 places*)



Involved passengers scenario



Driver



Passenger



3 2 Baby in chairs



ANNEXES

GTR EVS Phase 1 – Requirements for egress time:

Valeur selon la vitesse et le freinage [[modifier](#) | [modifier le code](#)]

Le freinage est réglementé par les nations unies avec un freinage minimum de $-5,8 \text{ m s}^{-2}$ d'un véhicule de tourisme et de -5 m s^{-2} d'un véhicule commercial⁴. Sur le marché commun européen, la décélération de l'AEB est au minimum de 4 m s^{-2} ⁵.

À titre indicatif, voici les distances de réaction, de freinage et d'arrêt pour quelques vitesses courantes en France, calculées avec un temps de réaction de 1 seconde, et des valeurs de -11 m s^{-2} et $-8,5 \text{ m s}^{-2}$ pour a_0 , correspondant à du bon matériel de 2012 sur sec et mouillé⁶.

Distance d'arrêt pour un freinage de -11 m s^{-2} et de $-8,5 \text{ m s}^{-2}$

	condition	v_0 [km/h]	v_0 [m/s]	réaction [m]	freinage [m]	arrêt [m]	temps d'arrêt
centre-ville	sec	30	8	8	3	11	1,75 secondes
centre-ville	mouillé	30	8	8	4	12	2 secondes
agglomération	sec	50	14	14	9	23	2,25 secondes
agglomération	mouillé	50	14	14	11	25	2,6 secondes
axe secondaire	sec	80	22	22	22	44	3 secondes
axe secondaire	mouillé	80	22	22	29	51	3,6 secondes
tronçon 90	sec	90	25	25	28	53	3,2 secondes
tronçon 90	mouillé	90	25	25	37	62	4 secondes
voie rapide	sec	110	31	31	42	73	3,7 secondes
voie rapide	mouillé	110	31	31	55	86	4,9 secondes
autoroute	sec	130	36	36	59	95	4,3 secondes
autoroute	mouillé	130	36	36	78	114	5,4 secondes

If we double the time for braking,
we can propose :

- **Te0'** to **Te1**: Time for deceleration + Time to open the door
Time for deceleration = 10s
Time to open the door = 10s
- **Te0'** to **Te1**: 20s
- **Te0** to **Te1** = 40+20 = 1 min

The criteria without smoke inside the passenger vehicle = **1 minute**

We need test result for the **Te1** to **Te2**