



# IWG Safer Transport of Children in Buses and Coaches

Sixth meeting

22/04/2021

OICA



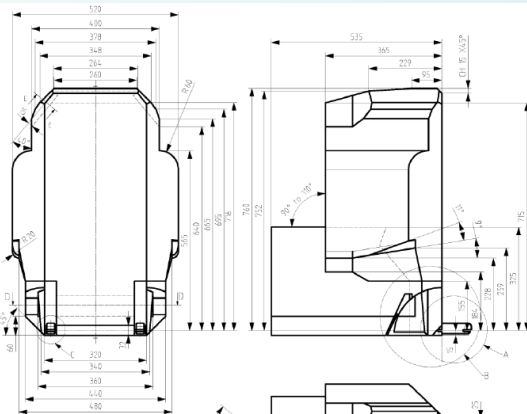
# CRS installation requirements Child Restraint Fixtures (CRF)

## Forward facing CRFs

### ISO/ F2, F2X, F3 Envelopes



### ISO/ B3 (B2) booster cushion

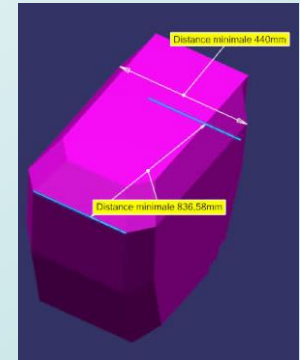


## UN-R16

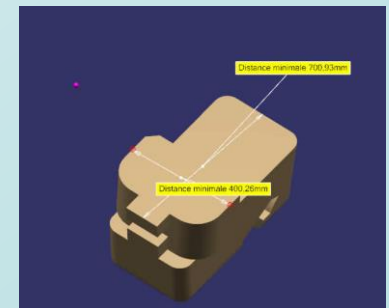
Envelopes	Dimensions
ISO/F3 – ISOFIX CLASS A	440 x 650 mm
ISO/F2 – ISOFIX CLASS B	
ISO/F2X – ISOFIX CLASS B1	
ISO/B3, ISO/B2 (reduced width)	520 x 535 mm
ISO/R3 – ISOFIX CLASS C	440 x 840 mm
ISO/R2 – ISOFIX CLASS D	
ISO/R1 – ISOFIX CLASS E	440 x 740 mm
UNIVERSAL	400 x 700 mm

## Rear facing CRFs

### ISO/R3



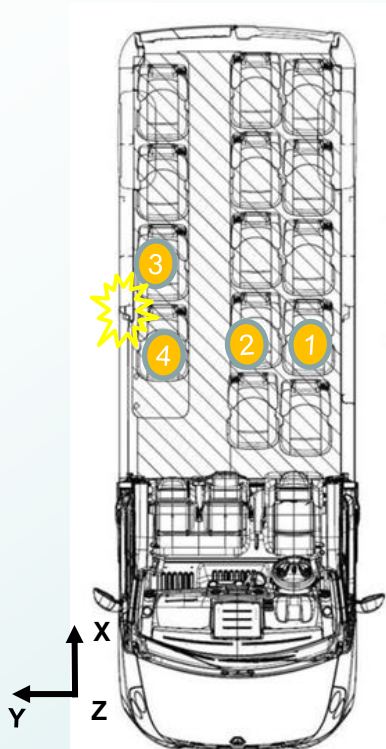
### UNIVERSAL



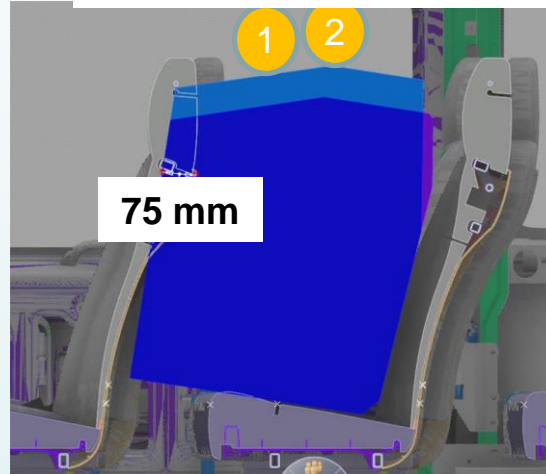


# Forward Facing Installation

ISO/ F2, F2X & F3 envelopes



Envelope to seat overlap

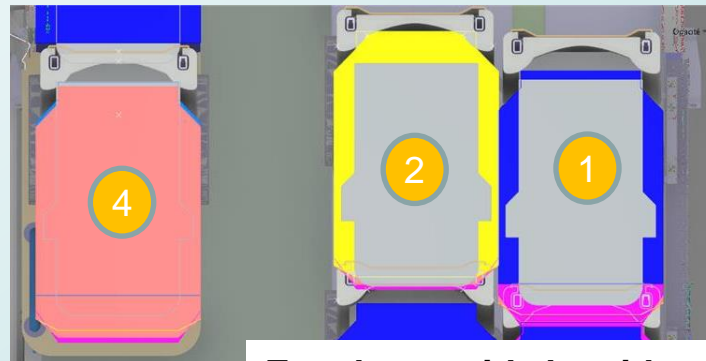


Z – view

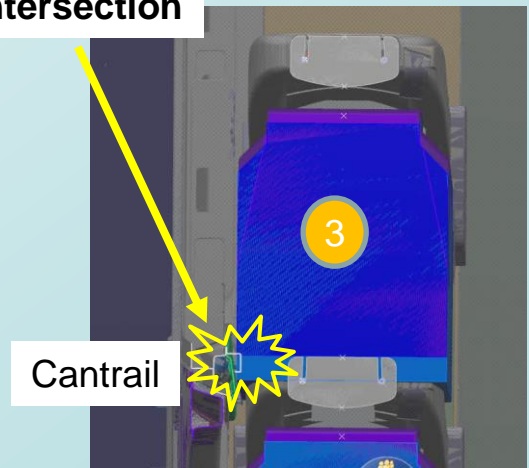


Z – view

Intersection



Envelopes side by side



Cantrail

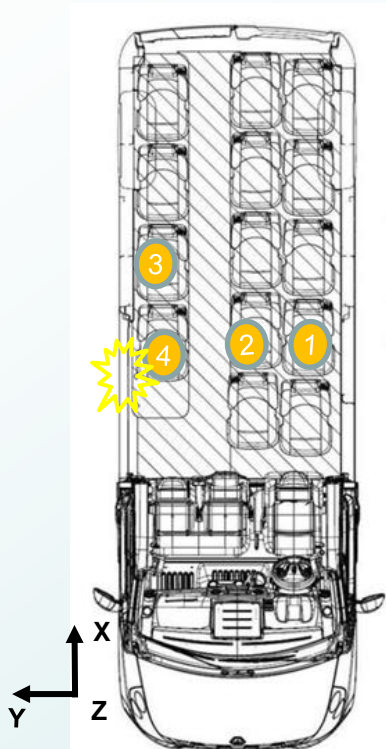
## Issues:

- Envelope/seat overlap
- Intersection w/ Interiors in outermost seats
- Emergency window location

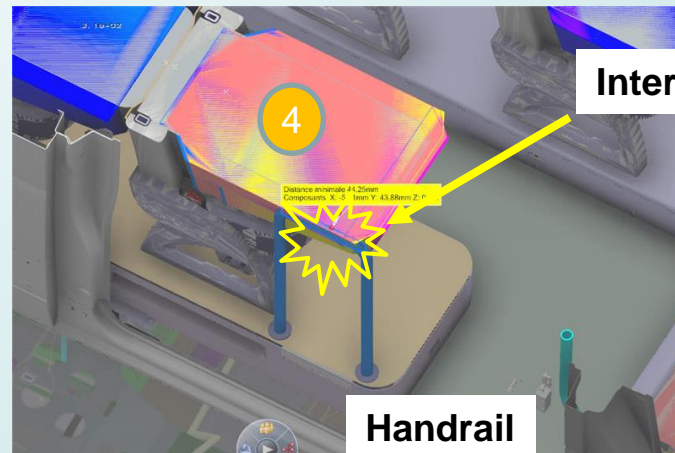


# Forward Facing Installation

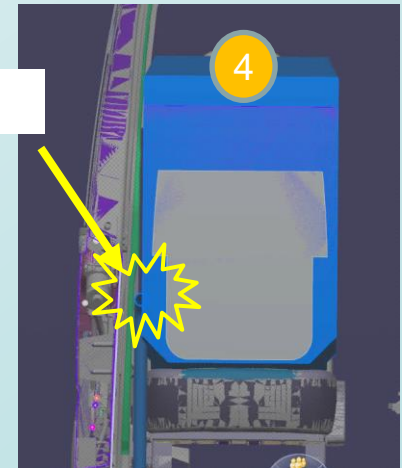
ISO/ F2, F2X & F3 envelopes



X – view



Handrail



## Issues:

- Intersection w/ handrail

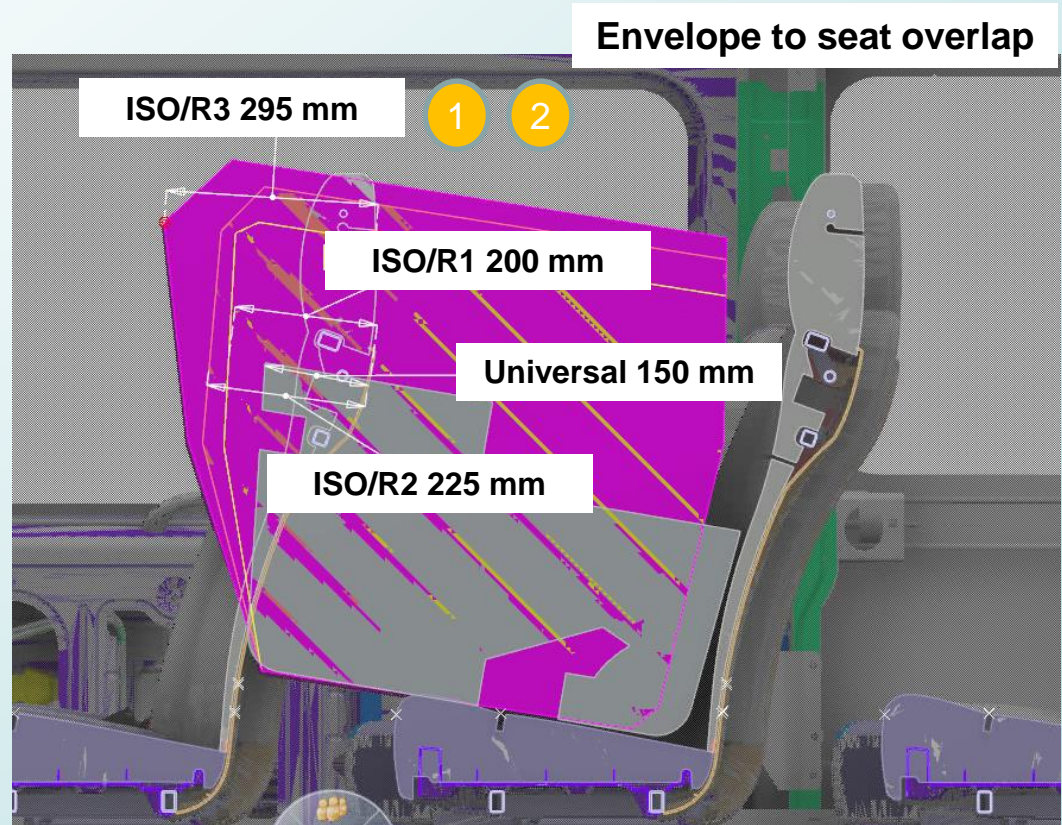
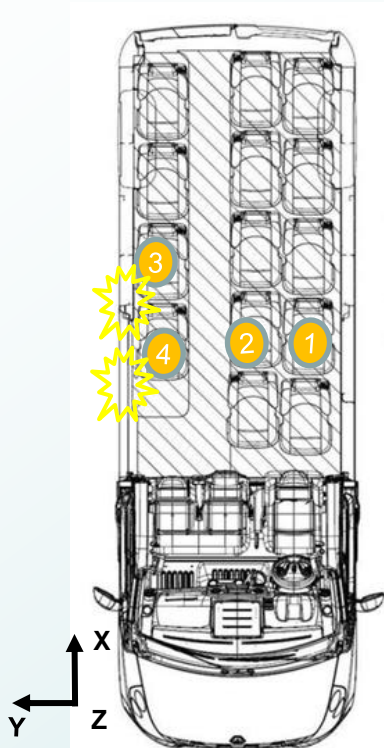




# Rear Facing Installation

ISO/ R1, R2 & R3 envelope

Universal envelope



## Issues:

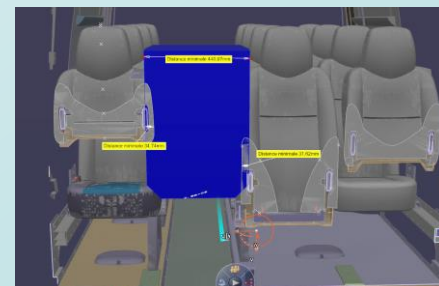
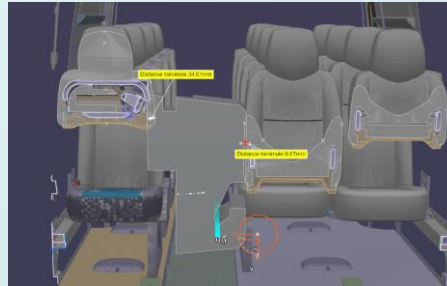
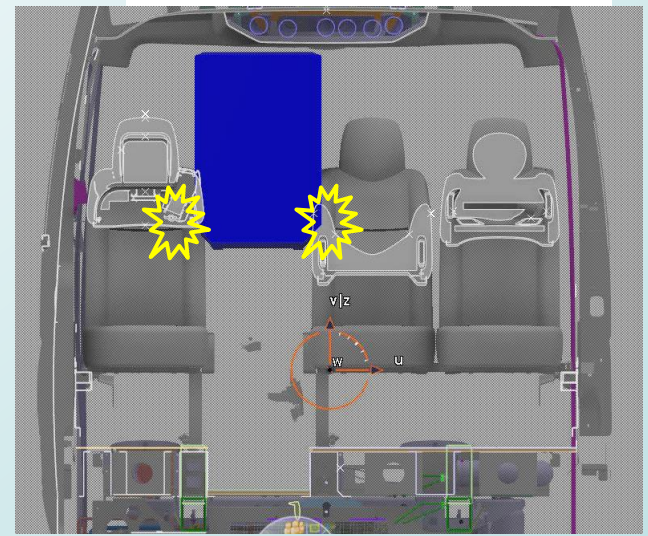
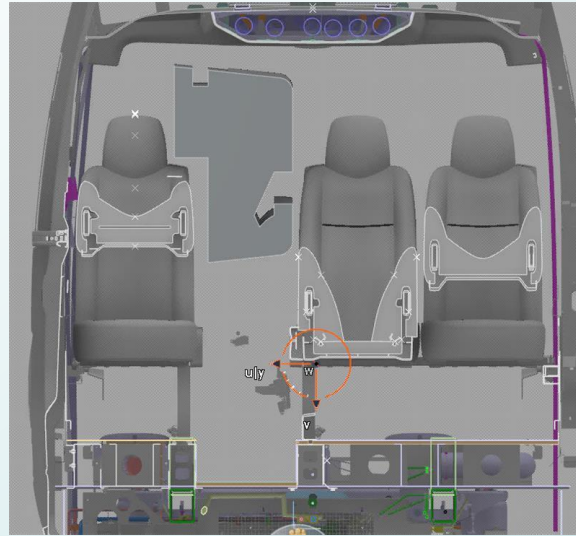
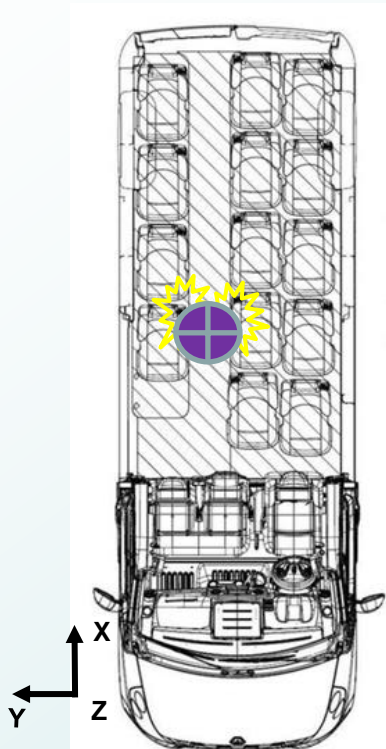
- Envelope/seat overlap
- Intersection w/ Interiors in outermost seats
- Intersection w/ handrail
- Emergency window location



# Gangway

Universal envelope

ISO/ envelopes



## Issues:

- **Difficult handling but can pass** (imagine a parent with a child and support the weight of the CRS)
- **ISO/ envelopes fail to pass**





# Conclusion

## Forward facing envelopes installation:

- Seat to seat distance increase from 650 mm to 750 mm
- ISO/ envelopes fail to pass gangway
- May intersect with interiors in outermost seats
- Intersect handrail
- Emergency window location
- Must remove 1 row of seats (losing significant seating capacity for Class B)

## Rearward facing envelopes installation:

- Seat to seat distance increase from 650 mm to 850 mm (case ISO/R3 950mm)
- ISO/ envelopes fail to pass gangway
- May intersect with interiors in outermost seats
- Intersect handrail
- Emergency window location
- Must remove 1 or 2 rows of seats (losing significant seating capacity for Class B)

## Universal envelope installation:

- Seat to seat distance increase from 650 mm to 800 mm
- Difficult handling but can pass in gangway
- Emergency window location
- Must remove 1 or 2 rows of seats (losing significant seating capacity for Class B)

