

i-Size SL X-length review

Another approach;

Additional requirements for CRS will create smaller CRS and provide more vehicle space.

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in presentation mode; please
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Current i-Size X-definition

X-short: 585 mm

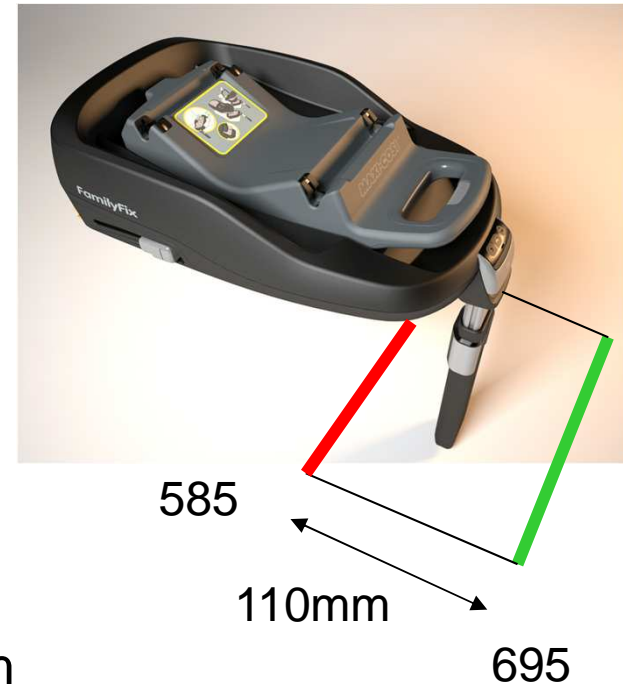
- This is formed by :
 - Largest vehicle in the market
 - (IsoFix to leading edge of cushion)
 - CRS needs to bridge this distance

X-long: 695 mm

- The second limit is formed by :
 - the IsoFix range adjustment of 80 mm

And

 - the thickness of the support leg (30 mm)



Current i-Size; consequences

CRS

- SL cannot be used with ISOFIX. (That's why we have the ISOFIX)
- Can have a seat with ISOFIX
- On average, the weight of the seat is compared to the weight of the seat with ISOFIX

Vehicle

- On average, the weight of the seat is compared to the weight of the seat with ISOFIX
- Interference with the front seat occupant
- Less space for front seat occupant with installed CRS

All discussed and accepted in the Ad Hoc working group.

However, wouldn't it be good if we had the same "Universal" results, but non of these negative aspects?

Thought....

Definitions on
next sheet

- If we split the requirements for fixed base length CRS and adjustable base length CRS, then both the X-short and X-long can be redefined closer to ISOFIX.
- Can we then;
 - provide more space for the vehicle occupant?
 - allow CRS'ses to be shorter, lighter and more easier to handle?

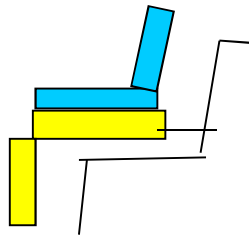


There are 2 CRS concepts

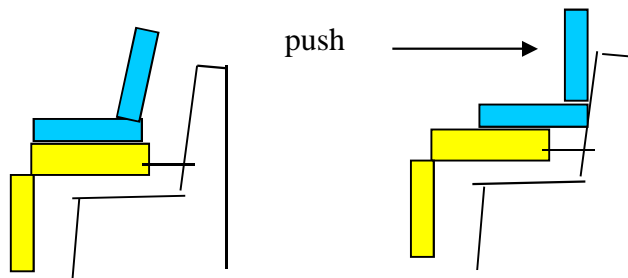
Based on design of the anti rebound device (ARD) function

1. Fixed base length

- 1A SL always touches same floor area; No movement of SL
Anti rebound by tethers etc.



- 1B Shell can move relative to base
Base can't move relative to anchor

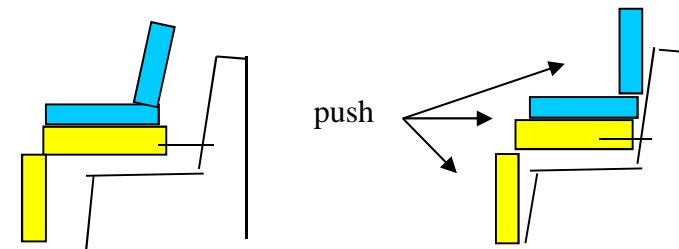


2. Adjustable base length

Base with SL will move relative to anchor, SL slides up to 80 mm.

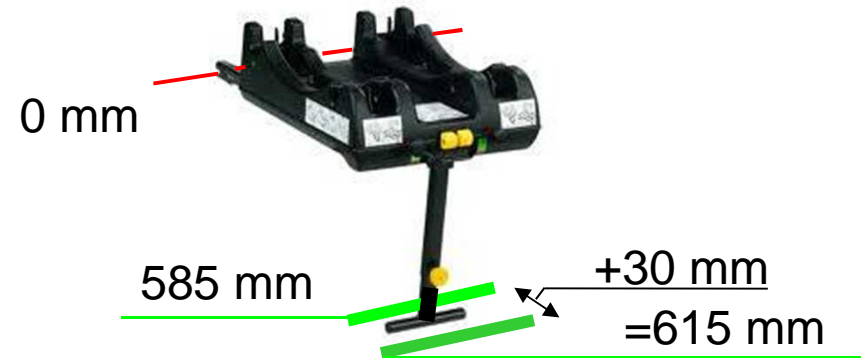
SL foot slides over the vehicle floor until:

- back of child seat contacts vehicle backrest, or
- SL foot touches heelkick, or
- SL upr area contacts front leading edge of seating cushion.



Requirements for fixed base length CRS

- Allow only 1 position for the SL of a CRS with a fixed base length
- Must be > longest vehicle in the market (Isofix to leading edge of cushion = 585 mm)
- Distance X-short to X-long is only the thickness of the SL (585+30=615 mm)



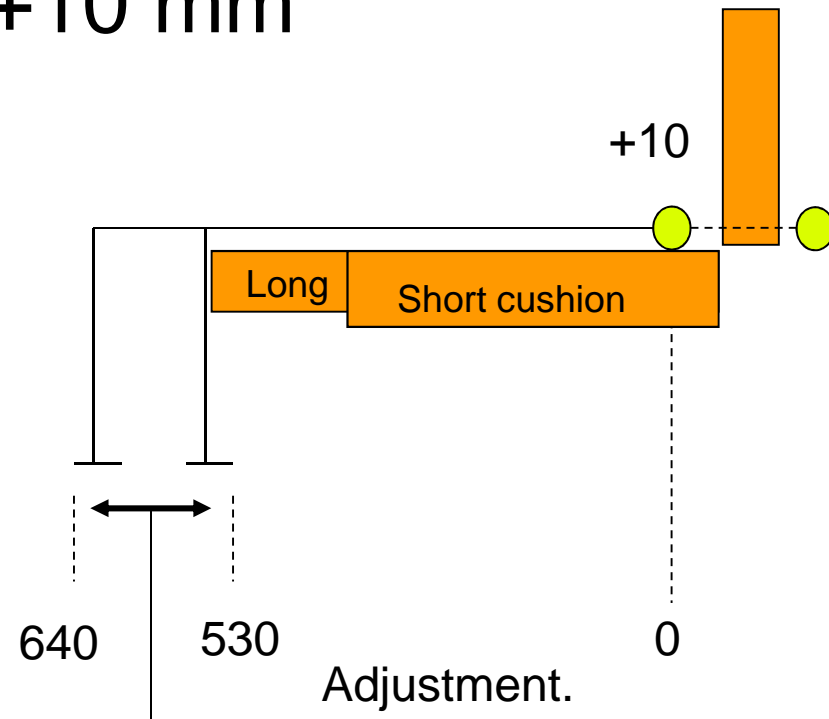
- Optional; CLEPA would like a bit more space for the SL thickness; eg not 30 but 50 mm.
- TBD later. Keep 585-615 for now



Adjustable base, X-short for a vehicle with ISOFIX at +10 mm

Reasoning;

- To guarantee ARD contact, the CRS should bridge the longest cushion to CR. If not, SL will contact seat cushion leading edge before ARD contact backrest.
- Longest cushion to CR = Vectra = 540 mm
- Bridge length: $540 - 10 = 530$



- This defines Xshort as 530 mm,
- with guaranteed ARD contact
 - keeping it “Universal”

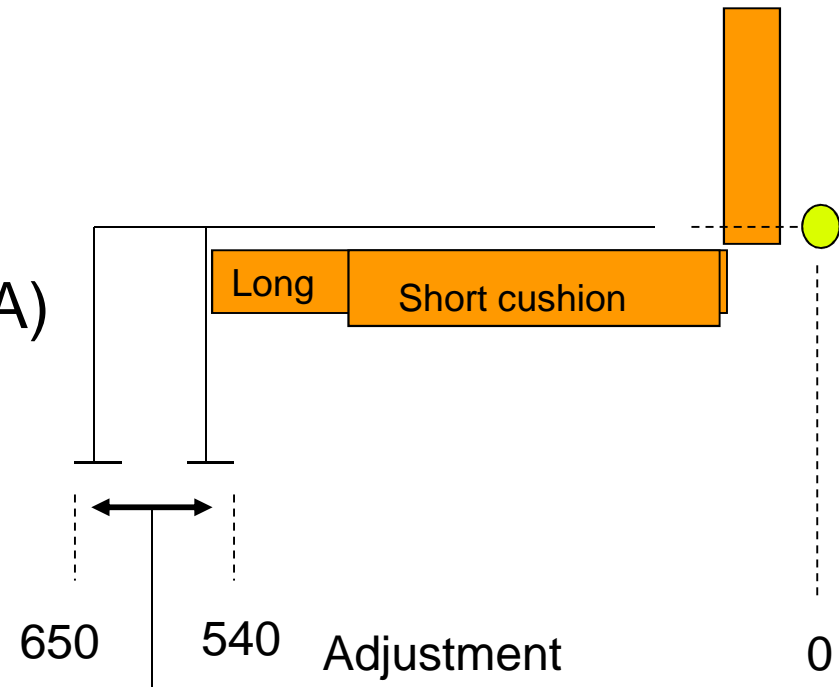
Adjustable base; X-long for a vehicle with ISOFIX at -70 mm

Reasoning

- X-short +range
- Range 110 mm
- $530+110 = 640$ mm
- + 10 mm Safety Margin (OICA)

This defines X-long as 650 mm

- with guaranteed ARD contact
- keeping “Universal”
- Improvement compared to current i-Size = 45 mm



Summary of values

	X-short	X-long
i-Size	585	695
Fixed	585 ¹ →	615
Adjust.	540 * ³ →	650

* = X-short for vehicle can be limited. See next page

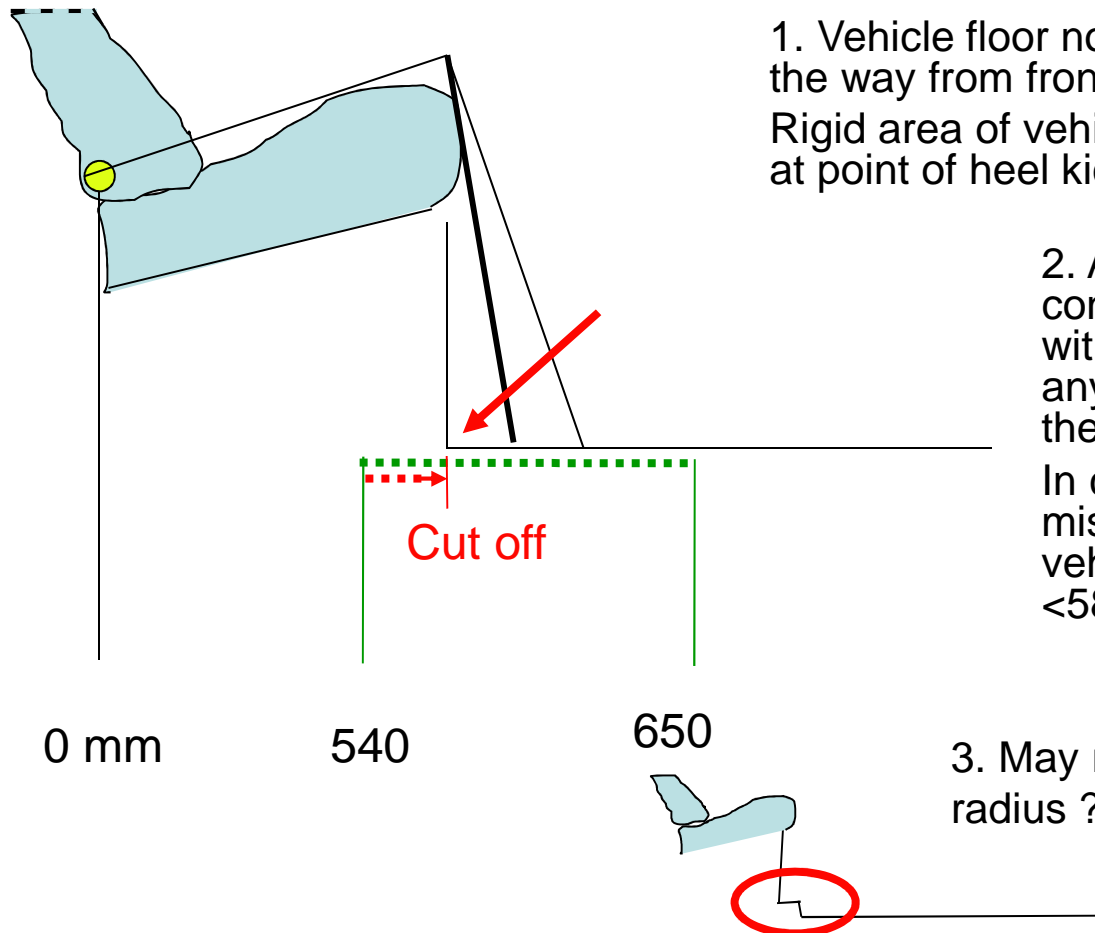
1. Due to SL thickness; + 30 mm

2. X-short is derived from vehicle with longest distance CR to seat cushion leading edge and +10 mm ISOFIX anchor; 'bridge' is 530. OICA prefers 540 mm for "safety margin"

3. X-long is simply Xshort +110 mm

To be considered; vehicle aspect

- Floor surface limited by heel kick ?



1. Vehicle floor not necessary to reach all the way from front to 530 mm.

Rigid area of vehicle floor may be cut-off at point of heel kick.

2. Additional benefit: As a consumer may install the CRS without fully unfolding the SL, any position possible, forward of the heelkick, is OK.

In current i-size draft this misuse is not solved; in most vehicles, the floor will extend <585 mm.

3. May require definition of max radius ?

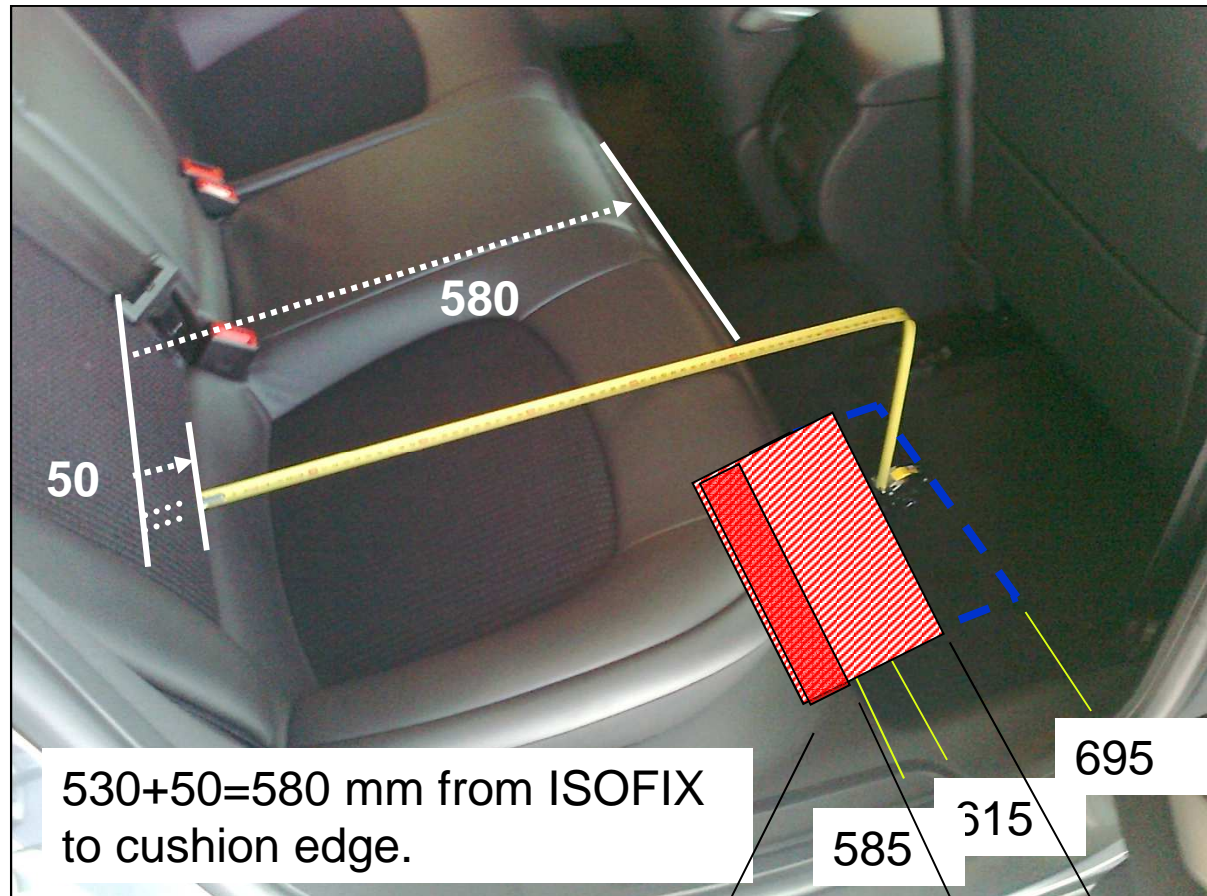
So, how does this translate to real life?
Time for examples.



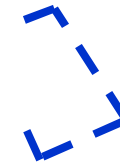
He: Did buckle little Johnny up, my dear?

Examples in large vehicle

CRS with a **fixed support leg** in a vehicle with a **long seat cushion** (Citroen C5)



i-Size square on floor; 585 to 695 mm



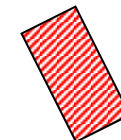
New proposal;

Fixed SL to contact floor at 585 to 615 mm



New proposal

Adjustable SL to contact floor at 540 to 650 mm



Limit by Heel Kick?

Example, small vehicle

Fixed X-position SL

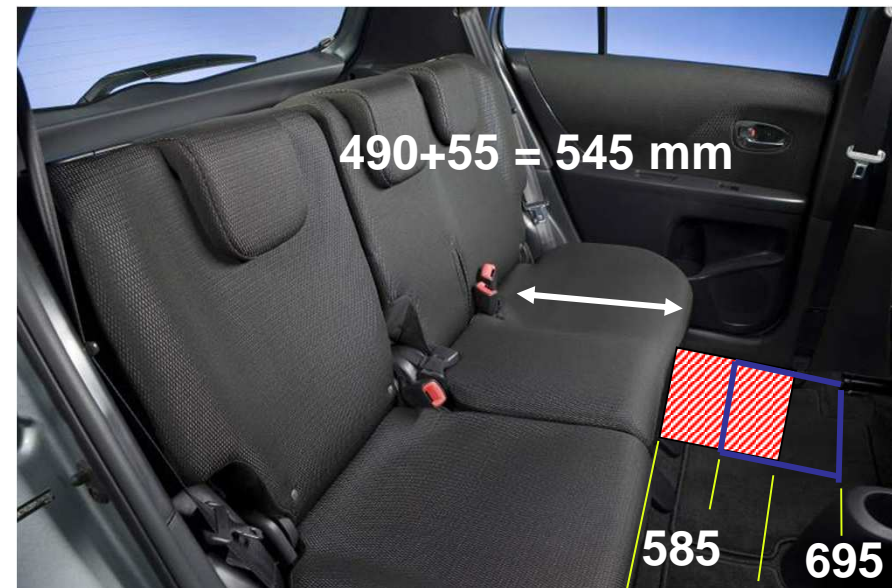
Small vehicle (Toyota Aygo 5Dr)



615

Flexible X-position SL

Small vehicle (Toyota Aygo 5Dr)



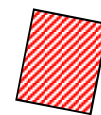
540 650



i-Size square on floor; 585 to 695 mm



New proposal for fixed SL 585 to 615 mm

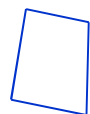


New proposal for flexible SL 540 to 650 mm

Example, short cushion vehicle

Fixed X-position SL
Short cushion (VW Touran)

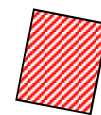
Adjustable X-position SL
Short cushion (VW Touran)



i-Size square on
floor; 585 to 695
mm



New proposal for fixed
SL 585 to 615 mm



New proposal for flexible
SL 540 to 650 mm

Consequences for CRS manufacturer

Advantages

- Allows X-long to be reduced from 695 to 650 mm.
- 45 mm shorter base & lighter CRS allows easier installation.
- CRS use in smaller vehicles will be easier; increases marketshare of i-Size seats vs R44 seats.

	X-short	X-long
i-Size	585	695
Fixed	585	615
Adjust	540	650

Disadvantages

- For fixed base length, only 1 position allowed.
- Adjustable base length:
 - SL may contact heel kick before anti rebound device contacts vehicle backrest. -> CLEPA to rethink anti rebound device constructions

Consequences for vehicle manufacturer

	X-short	X-long
i-Size	585	695
Fixed	585	615
Flex	540	650



- R14/R16 update with new values

- Stiff floor area same or smaller compared to current i-Size def.
- Thought needed on heel kick to floor area; min/max radius?
- No consequence for rear seat design compared to current i-Size (positioning of ISOFIX anchor, cushion shape etc)

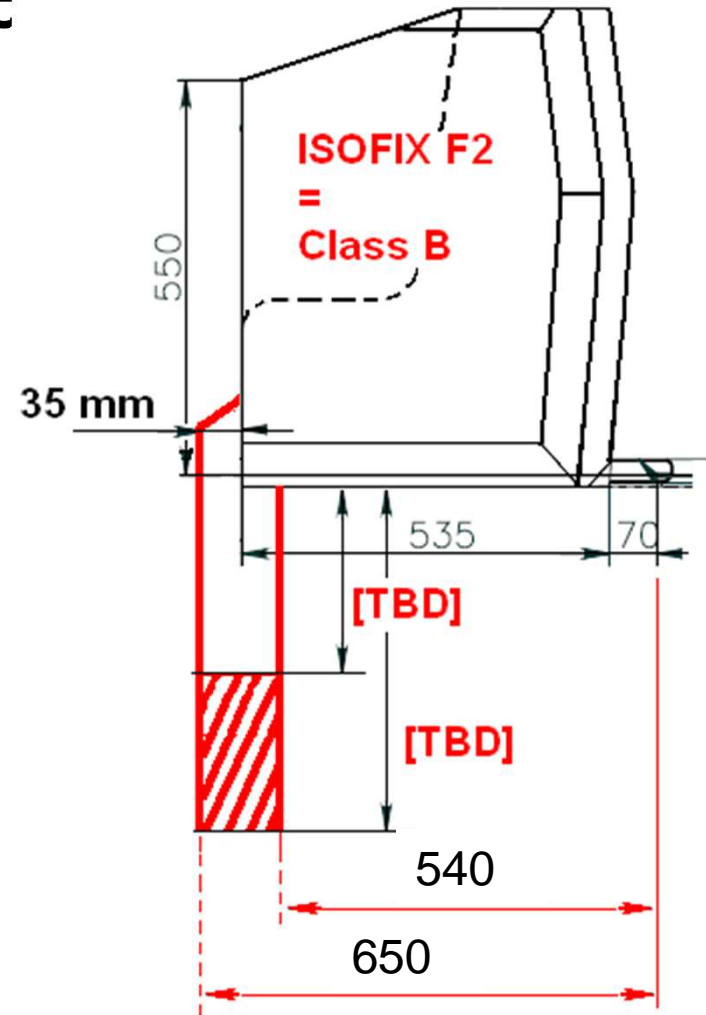


Secondary positive effect F2 / Class B envelope

Picture shows 35 mm space
required for upper area of
support leg; i-Size currently
needs 90 mm

Z values

- To be recalculated, based
on avg vehicle's pitch angle



If the idea works...

Consequence for CLEPA

- Splitting requirements for CRS keeps all universal for consumer
- Anti Rebound Device contact guaranteed for flex x-length systems
- 45 mm shorter X-long vs i-Size; less stiffness req.
- Less mass = less cost
- Less mass = easier handling by user
- Less mass is less fuel consumption.

	X-short	X-long
i-Size	585	695
Fixed	585	615
2nd idea Flex	530	640

Consequence for OICA

- Adding only requirements for CRS, no additional requirements for vehicle
- 45 mm shorter vs i-Size, so ...
- 45 mm more space for front seat occupant!
- Smaller problem with upper area of SL

Check items (currently checked by OICA)

- Is the longest cushion (CR to seat cushion leading edge) indeed 540 mm (Vectra)?
- Do we require definition of heelkick to floor corner?
- Recalculate Z values.

lower priority

- can we increase X-Long for a fixed base length CRS from 615 to 630 ? This will allow more design freedom in the telescopic system. Consequence for vehicles? None?

Action list

- OICA and CLEPA discussed together 20 nov 2011. No problems encountered.
- OICA to use the CLEPA prepared physical jig to assess the proposal in their cars
- Circulate jig within OICA from Nov-Feb2012
- Allow for feedback before Feb 2012 meeting
- Pre meeting in Feb 2012.