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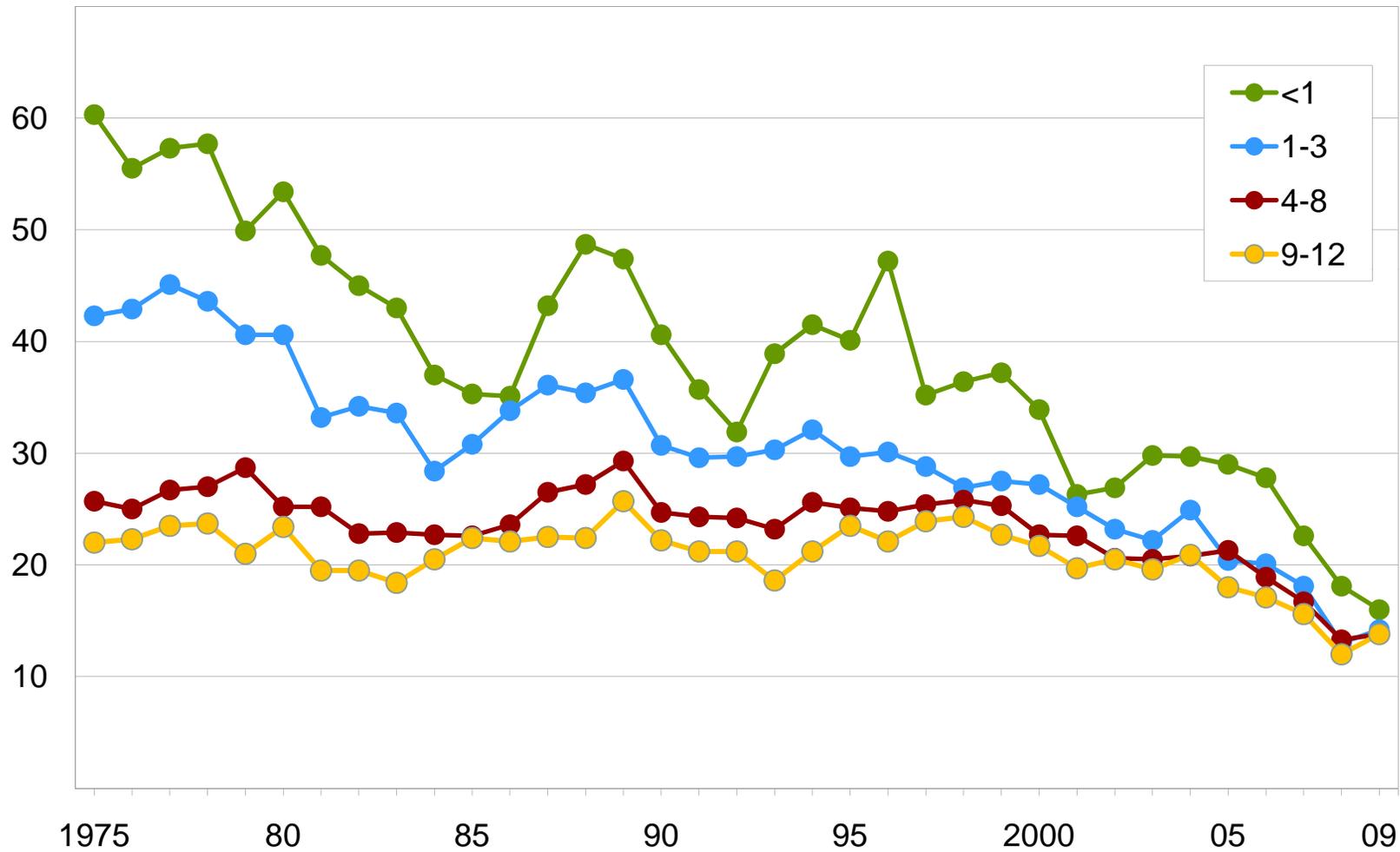
Highway Child Passenger Safety

NTSB Forum on Child Passenger
Safety in the Air and in Automobiles
Washington, DC • December 9, 2010

Anne Taylor McCartt

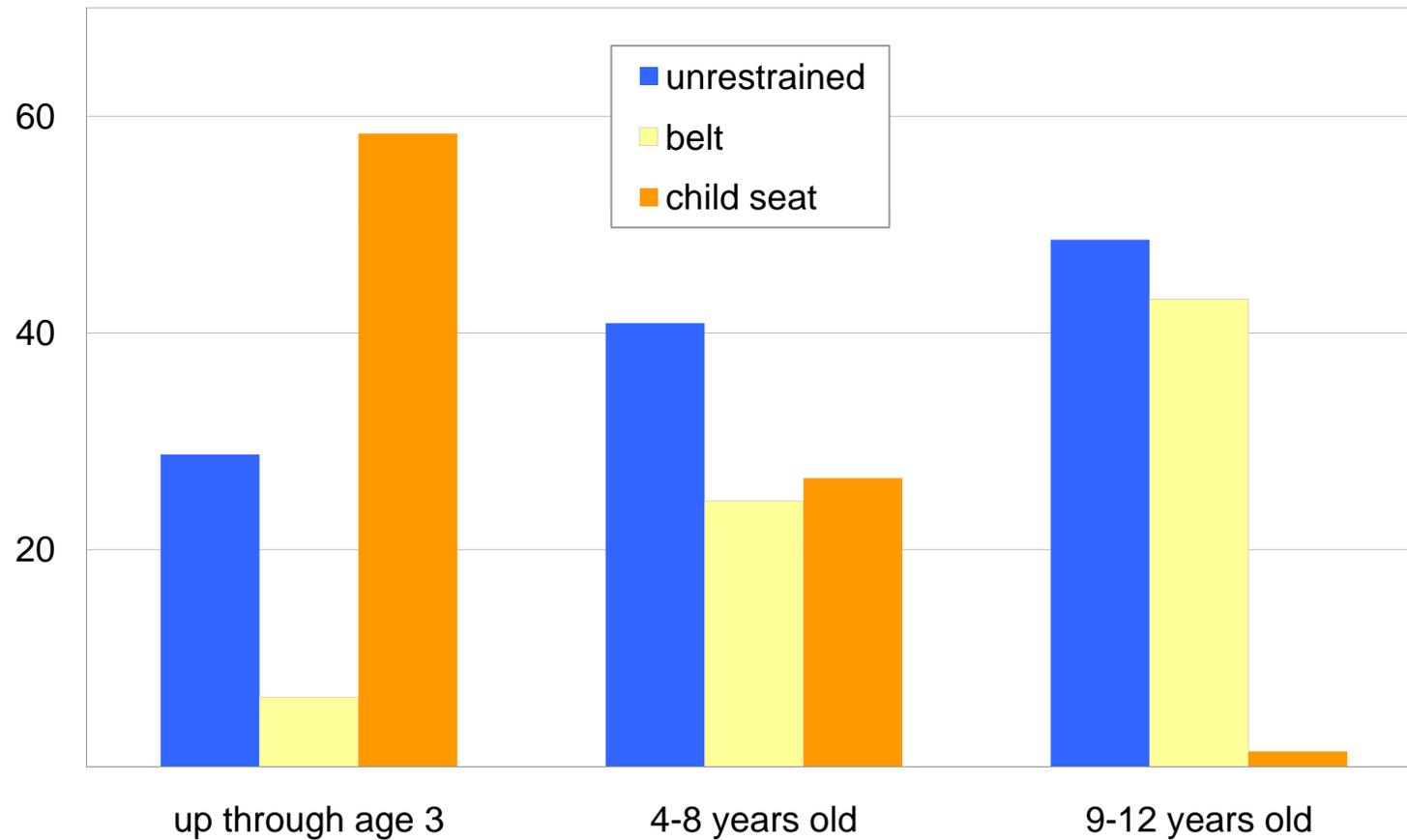
Child passenger vehicle occupant deaths per million children

By age, 1975-2009



Percent restrained vs. unrestrained children killed in passenger vehicles

By age, 2009



Importance of belt-positioning boosters

- Boosters used with lap/shoulder safety belts are safest way for children to ride after they outgrow their forward-facing restraints
- Boosters with belts reduce injury among 4-8 year-olds by 45 percent compared with safety belts alone
- Boosters raise the child
 - Move shoulder belt off neck and onto shoulder
 - Improve lap belt angle, which improves lap belt fit
- Belt routing features further improve belt fit
- More comfortable belt fit helps to reduce belt misuse

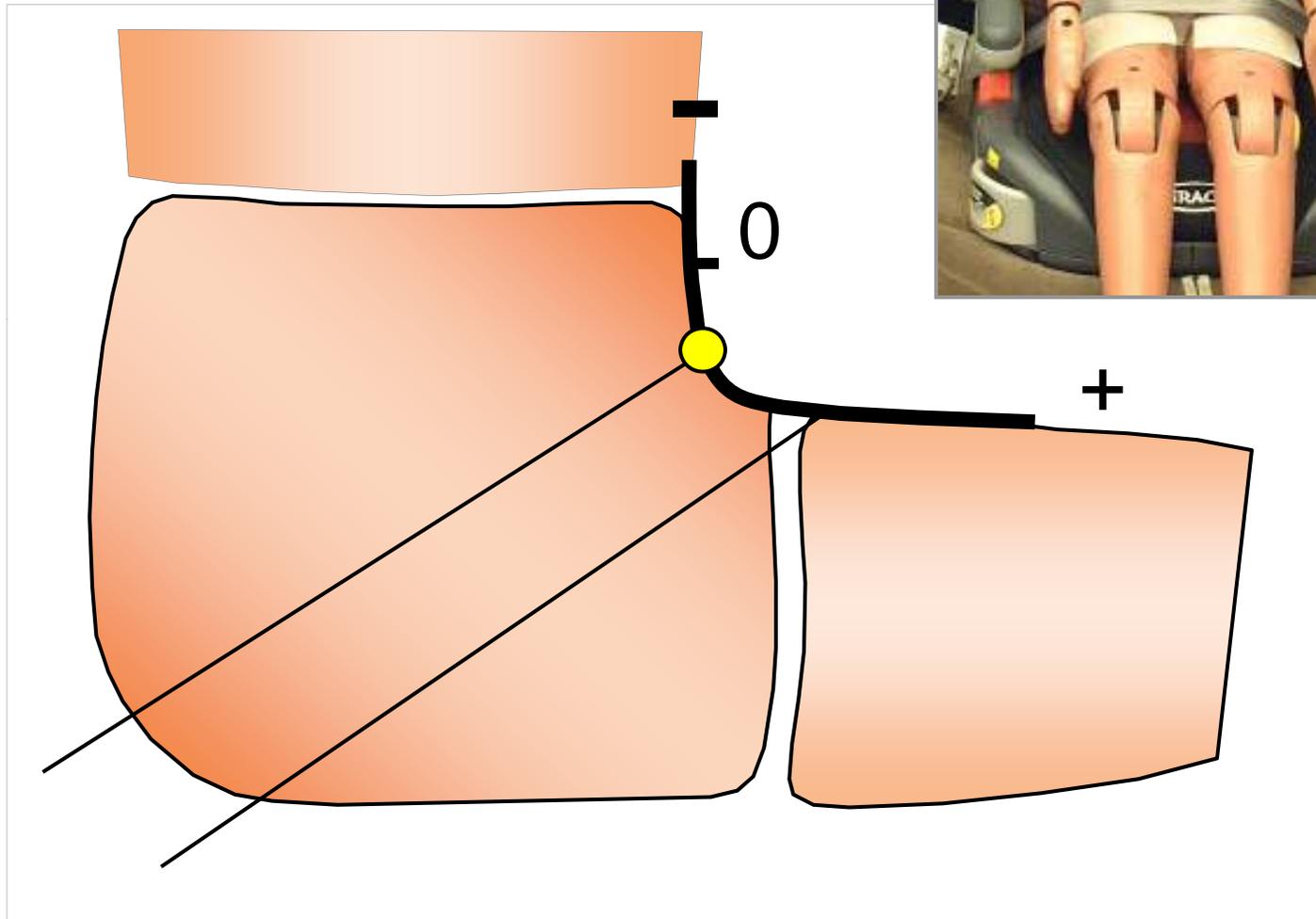
Boosters can improve 3-point belt fit



Not all boosters achieve the objective



Lap belt fit measures



Range of lap belt fit

too high on abdomen



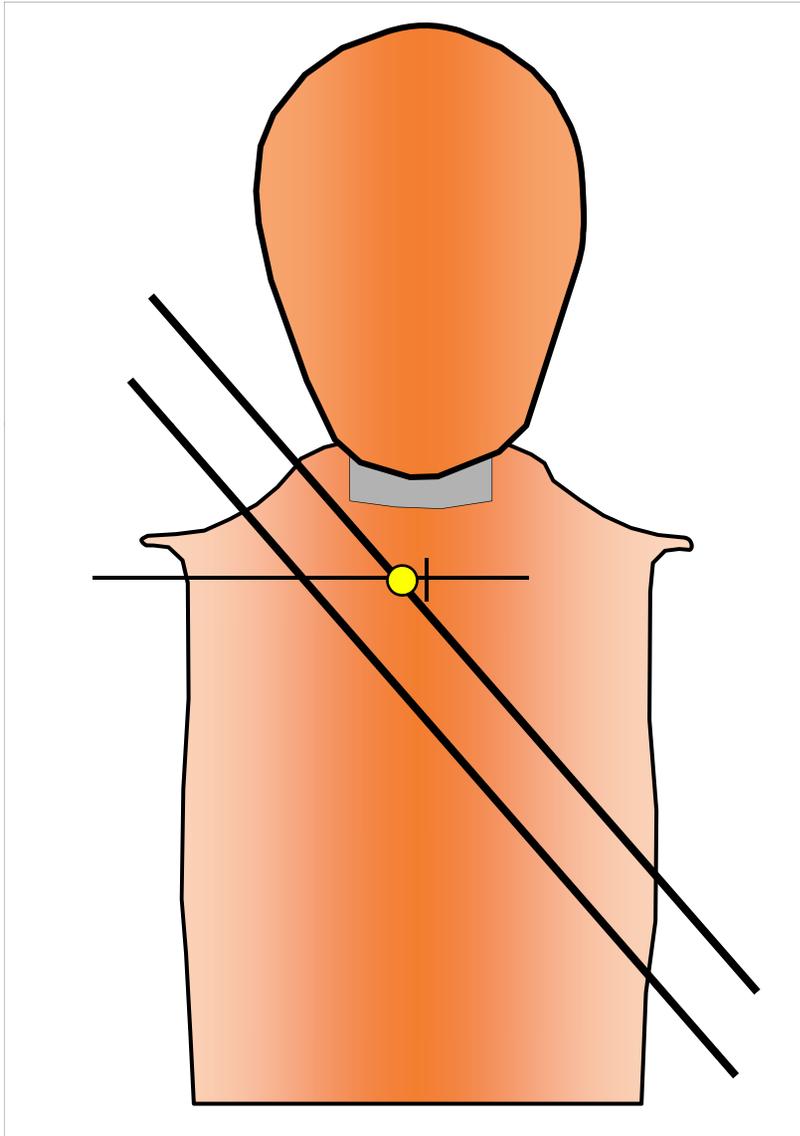
better: engages pelvis



good



Shoulder belt fit measures



Range of shoulder belt fit

too close to neck



good



too far outboard



4 lap and shoulder belt test configurations that represent range in passenger vehicle fleet

IIHS booster seat ratings

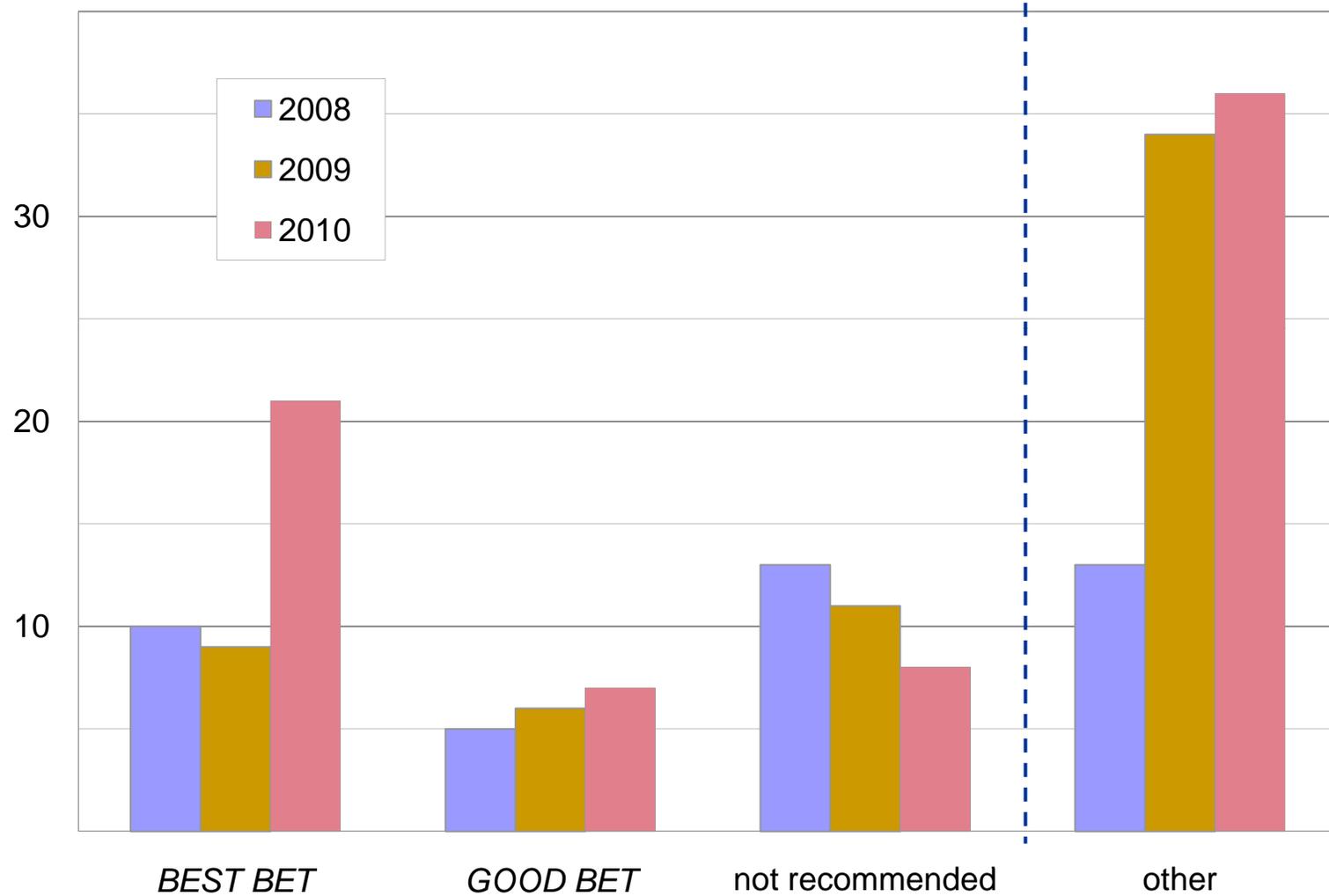


lap belt angle



shoulder belt location

Booster seats are improving



Lower Anchors and Tethers for Children (LATCH)



- Top tether anchors required by model year 2001
- Lower anchors required by model year 2003
- Top tether straps on nearly all forward-facing child restraints since 1999

LATCH use

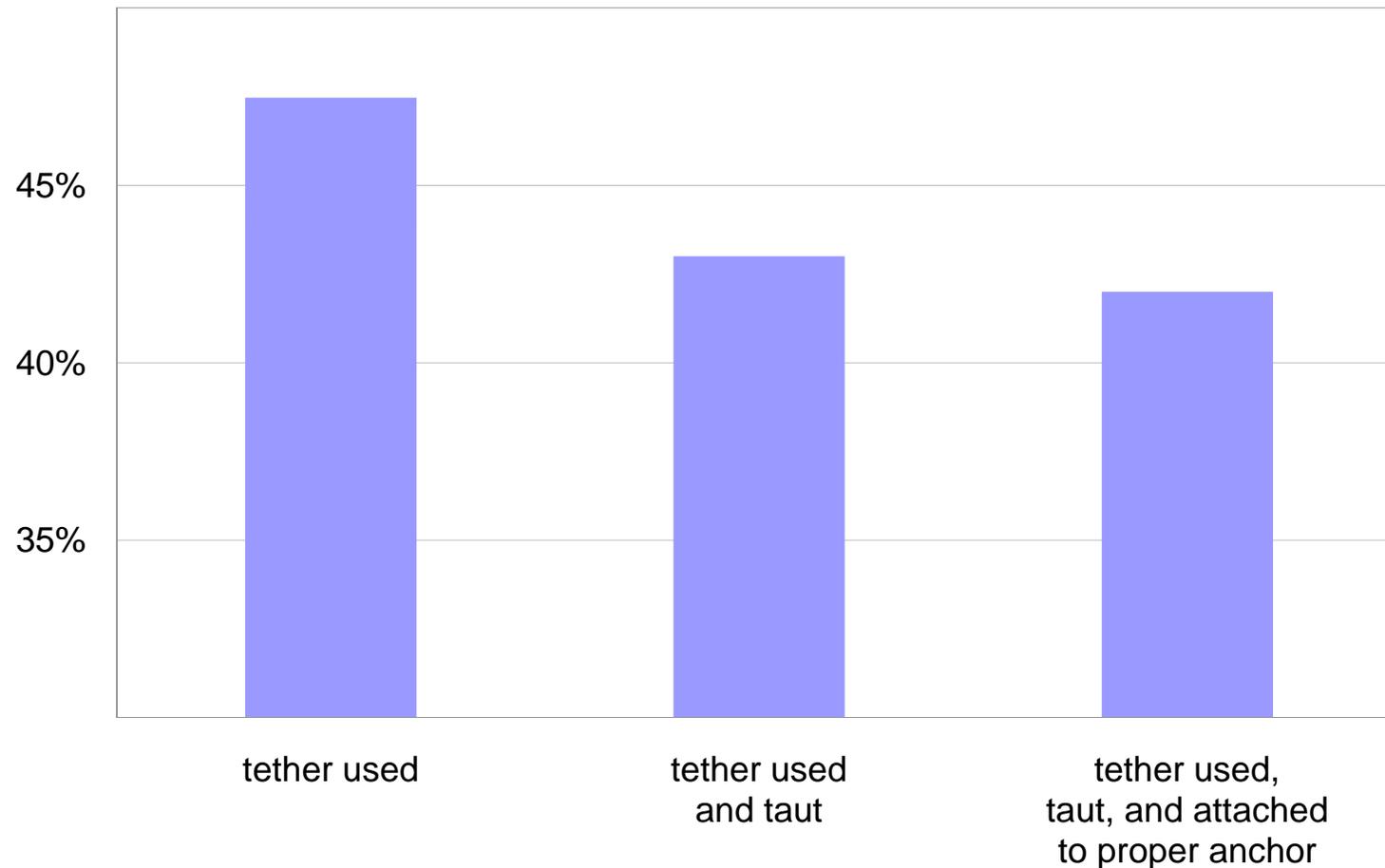
- LATCH intended to make child restraint installation easier and to standardize restraint attachments to vehicle
- 2005 observations in vehicles with LATCH available (Decina and Lococo, 2007)
 - Of forward-facing restraints with top tethers that were in seating positions with tether anchor, 51 percent were installed with the tether
 - Of restraints with lower attachments that were in LATCH-equipped seating positions, 63 percent were installed with the lower anchor
- Even with LATCH, misuse continues

Child restraints with vs. without tether



Observed tether use with forward-facing child restraints

2001-11 passenger vehicle models, 2010 survey in Maryland and District of Columbia



Tether use varies by vehicle type and age

- 13 percent of vehicles observed were older than 2001; tether use was lower in these vehicles (19 percent) than in 2001 and newer models (47 percent)
- Use was similar in cars, minivans, and SUVs (42-45 percent), but lower in pickups (17 percent)
- Attaching top tether is simple way to keep children safer, but tether use remains low
- Tether use is part of publicity campaigns about LATCH; many parents may not know a tether is needed when attaching restraint with safety belt

Assessing LATCH usability in current vehicle fleet

Ongoing IIHS and UMTRI research

- Background
 - Despite efforts to standardize child restraint attachments, LATCH usability varies by vehicle due to differences in seat geometry, anchor locations, etc.
 - SAE and ISO have independent recommended vehicle practices for LATCH, but these have not been fully evaluated
- Study objectives
 - Document range of vehicle features in current vehicle fleet
 - Assess LATCH usability (easy-to-use correctly) using SAE and ISO recommended practices
 - Determine whether good ISO usability ratings correspond to real-world LATCH installation performance



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Dedicated to reducing deaths, injuries,
and property damage on the highway

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