



# Lap Shoulder Belts in North Carolina and Beyond

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NC Department of Public Instruction

# **US Department of Transportation Secretary Mary Peters NPRM Announcement**



# Notice of Proposed Rulemaking

- High Back School Bus Seats
- Required Lap/Shoulder Belts on small school buses (under 10,000 pounds)
- Standards for lap belts / lap shoulder belts
- Requires 15” “rump room” per student
- “402” funds can be used
  - Through Governors Highway Safety Office
  - (no additional money in the pot!)



# Notice of Proposed Rulemaking

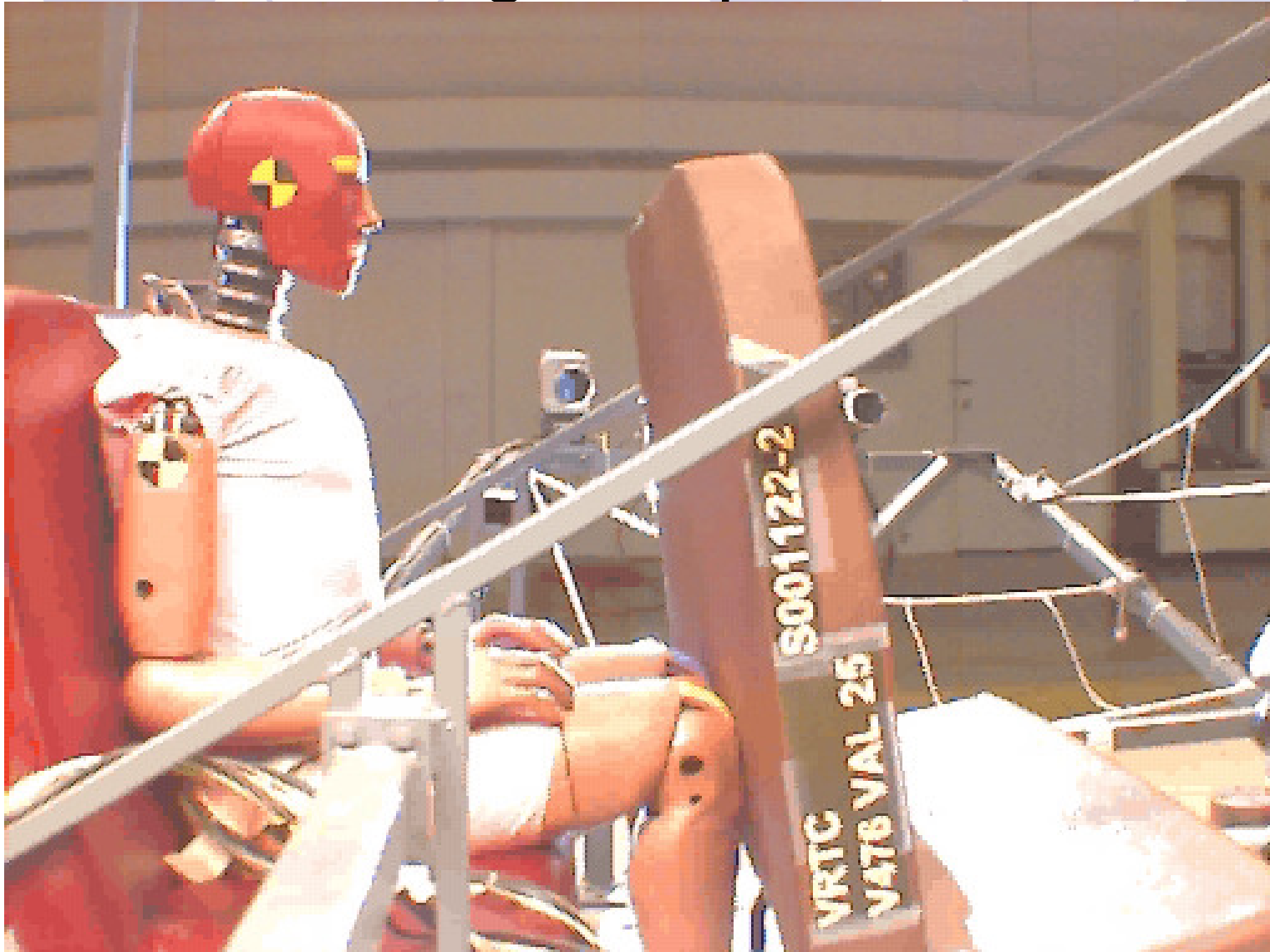
- Comments were due January 22
- In NHTSA's Court to Respond



# Compartmentalization



# NHTSA Testing – Lap Belts



# NHTSA Testing – Lap/Shoulder Belts



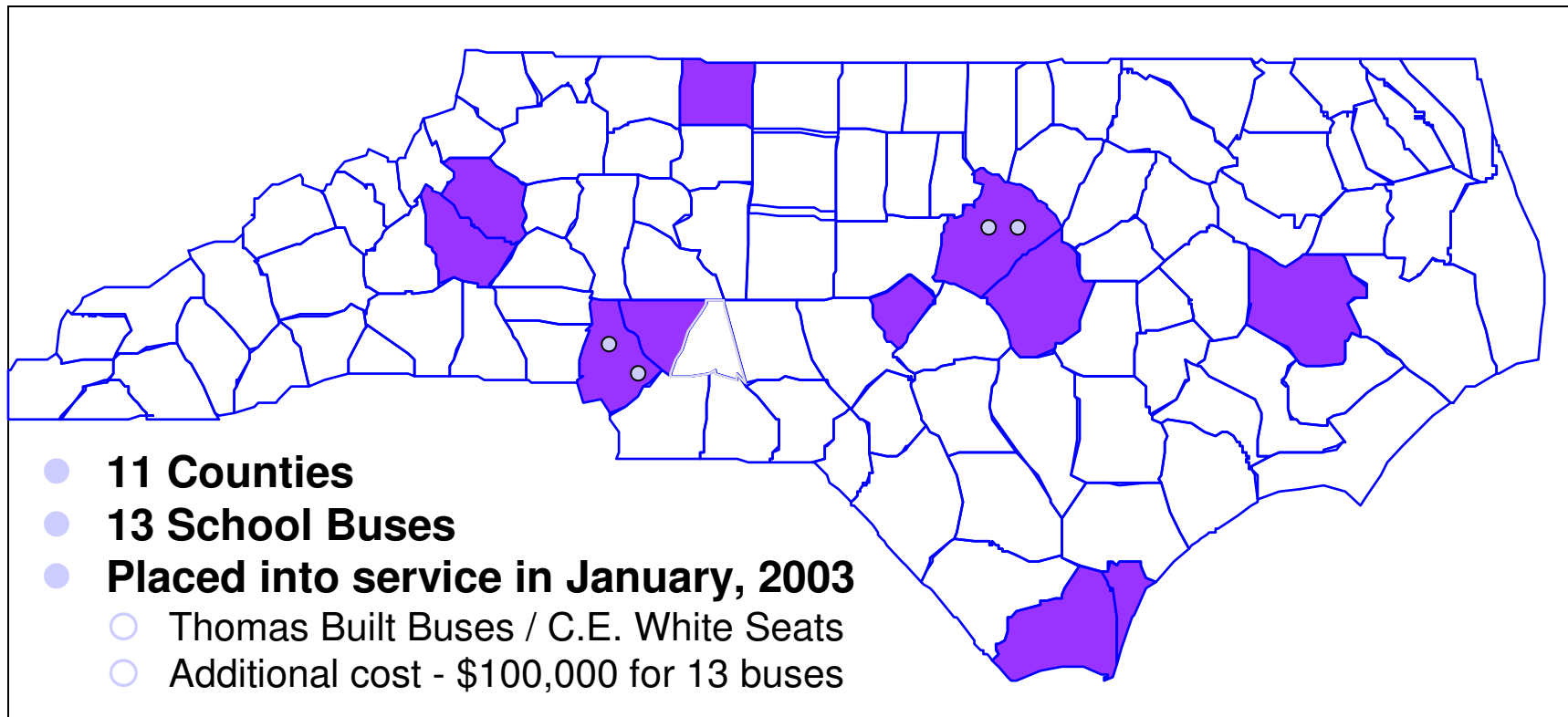
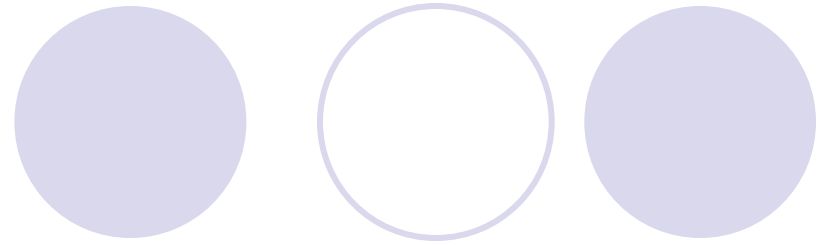




# 3 Point Belts on School Buses in North Carolina

- Legislation in New York, New Jersey, Florida, California, Texas – who's next??
- November, 2001 – Initial research of a potential pilot implementation of 3-point belt seats, sparked by information at NAPT
- April, 2002 – NHTSA findings indicating potential benefit to 3-point belts
- Need for DATA
- December, 2002 – Delivery of 13 buses to 11 districts; placed into service in January, 2003
  - Additional cost - \$100,000 for 13 buses
- Legislation – NC General Assembly directed the Child Fatality Task Force to Report back 2008

# 3-Point Belt Pilot Districts



Note: Thomas Built Buses now installs IMMI 3-point belt seats, The cost increase as of March 2006 is 10%-12% compares with equivalent bus without 3-point belt seats.

# Bus Configuration

## Capacity: 59

- Seating Options:
  - 3-2 seating (5 positions per row)
  - 2-2 seating (4 positions per row)
- Decided on 3-2 to preserve capacity
- Capacity Change
  - 59 vs. 71 elementary
  - 59 vs. 48 high school
  - 59 vs. 59 middle school
- (Thomas agreed to provide an additional body section)



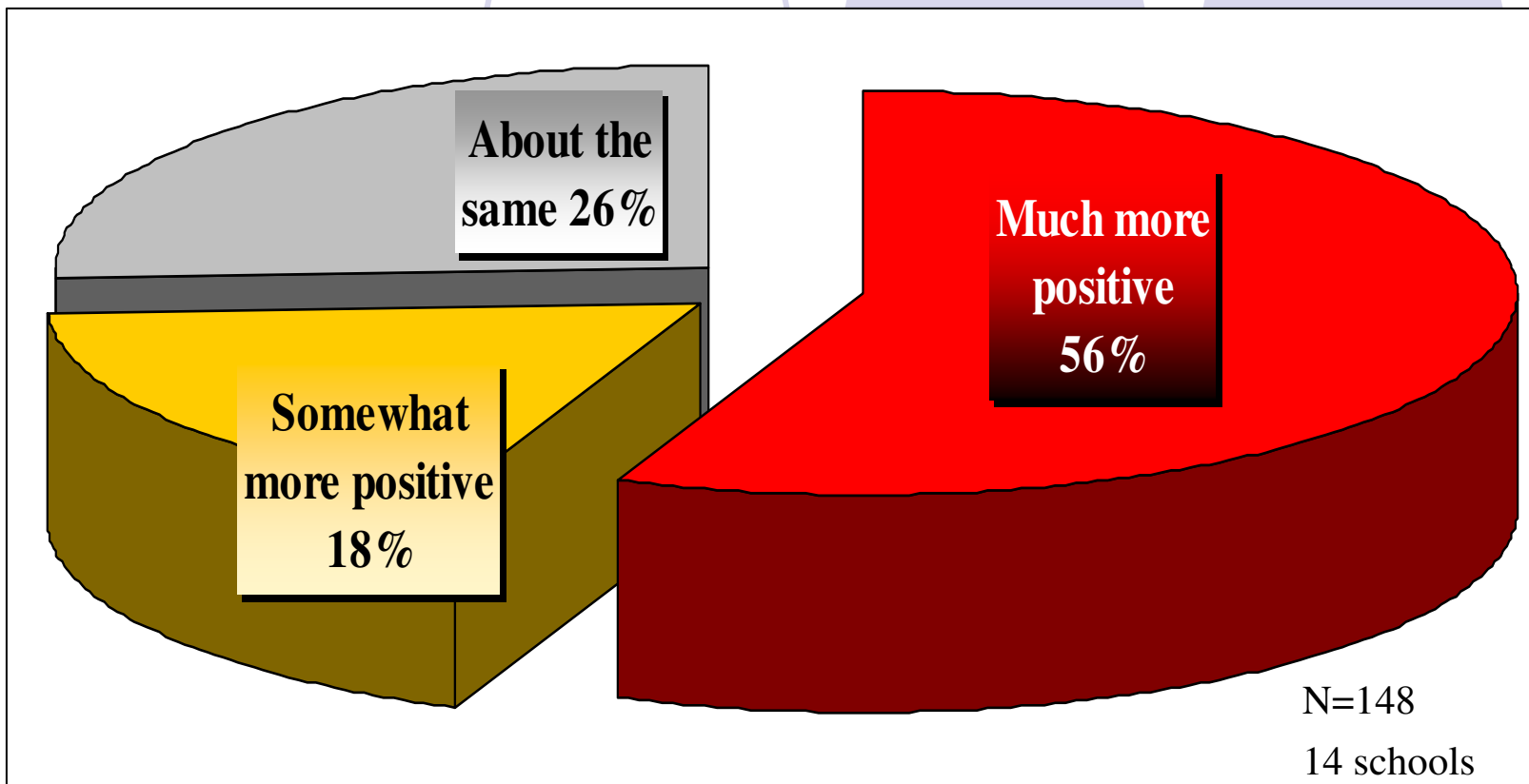


30 Inch Seat.....45 Inch Seat





**In general, how would you describe your view of lap/shoulder belts in buses now compared with before your child rode the bus with lap/shoulder belts?**



# Summary of Parent Comments after Children's Participation in Pilot Project

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- Parents whose views were more positive after their children rode buses with lap/shoulder belts were most likely to cite safety as the reason for their more favorable view. Some believed that the belts help drivers maintain discipline and keep children in their seats.
- Other parents noted that the laws that apply to cars should also apply to school buses.
- Parents expressed positive views as well as concerns with respect to the ability of belts to decrease the incidence of bullying on the bus.
- A few parents were concerned that the taller seats and narrower isles might create problems for larger children or make it difficult for the driver to see to the back of the bus.

# Children's Attitudes toward Lap/Shoulder Belts after Participation in Pilot Project

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## Summary of Findings

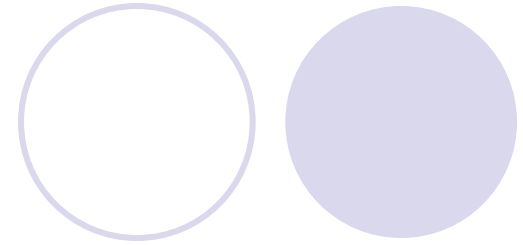
- The vast majority of children expressed positive attitudes toward all aspects of lap/shoulder belts after participating in the pilot project.
- Teenage children were likely to experience somewhat lower levels of enjoyment of their ride to and from school than younger children with respect to the use of lap/shoulder belts.
- Girls were somewhat more likely than boys to agree that lap/shoulder belts would make them feel safe on the bus with respect to bullying.







# Seating Space Elementary vs. Middle School



K1 and 1<sup>st</sup> graders



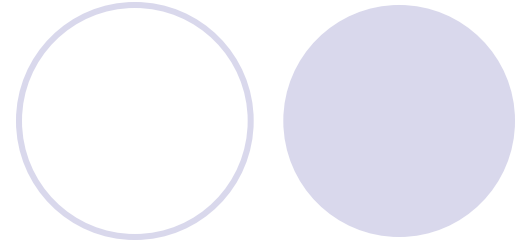
Two middle school students.

2 Middle,  
1 Elementary  
Tight!





# Seating Space, 3-person seat High school-age passengers

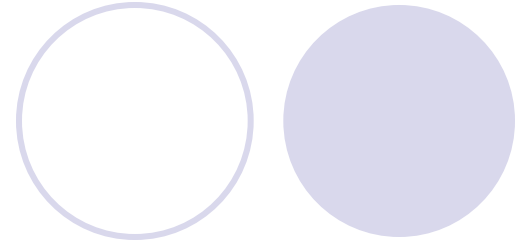


Seating Space, 3-person seat  
High school-age passengers





# Seating Space, 2-person seat High school-age passengers



# Seating Space, 2-person seat High school-age passengers





# Belt utilization and enforcement

- Utilization Estimate by drivers
  - 50%~75% of the elementary school student used the belts
  - Nearly 0% usage amongst middle and high school students
- Stokes county conducted a covert operation by marking the metal clip; 14 out of 28 showed the belt clip was used (usually has 40+ riders but portion of the students were released early due to EOG)
- Driver Enforcement
  - Impossible in the AM
  - PM - driver could do a sweep before departure
  - New Hanover county driver had a 5<sup>th</sup> grade student help out with enforcement. Lee county also has a “buddy” system



# Utilization and Enforcement (Cont'd)

- Even with initial training, passengers do not know or do not bother to properly adjust shoulder strap.
- Driver with few discipline problems in a bus without belts have more success enforcing belt usage in a bus with belts.
- Driver with few discipline problems in a bus without belts experience fewer benefits in a bus with belts.



# Operational Impact: Seating Space

- 3-2 Seating spacing is not adequate for middle school / high school with full loads
- 1 district started the bus at a high school but moved it quickly to an elementary school due to the lack of seating space for high school students.
- The 4 out of 5 LEAs using buses exclusively for elementary school will not consider using the buses for middle and high schools due to size of the seat.
- 1 district may switch to middle school next year to address discipline problem.
- Important to assign seats so “first-off” sits closest to aisle to prevent passengers from having to unbuckle/re-buckle.

# Students Perspective



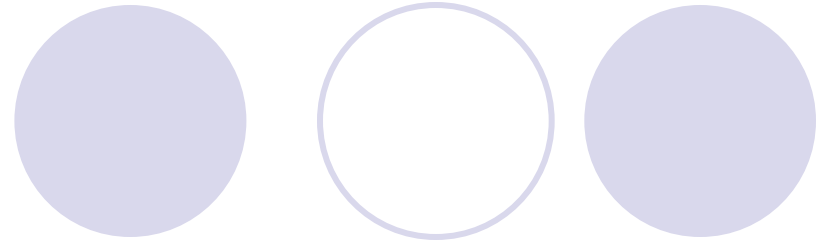
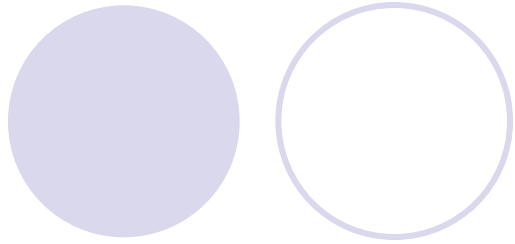
# Driver's Perspective



# Drivers' Perspective

- Driver generally liked the 3-point restraint seats. Most noted the longitudinal activities (fore/aft) are totally absent, however could not discern if this was due to high back seat or attributed to seatbelts.
- It will be an added distraction for drivers to monitor and to enforce passenger belt usage.
- Due to high seatback, drivers cannot see but the tallest students. This was especially a concern for middle and high school.





- Vandalism has not been a major problem thus far, but it does exist
- No report of using it as weapon



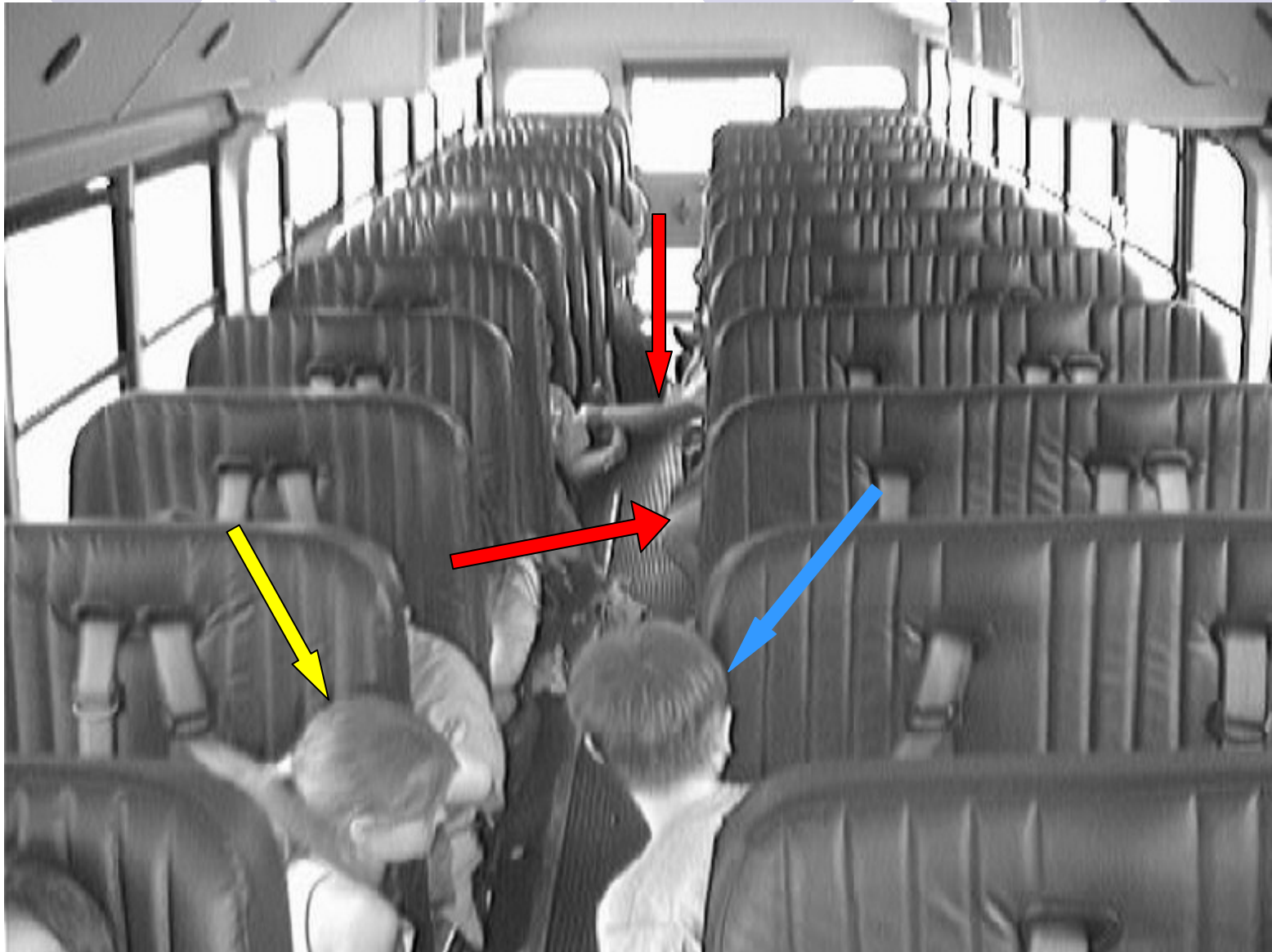
# Pen Holes – Covers More Expensive



# Out of Compartmentalization Space (OOC)



# Partially Out of Compartmentalization Space (POC)





# Summary observations

- With enforcement, elementary students in buses with 3-pt. belt experienced:
  - reduction in OOC activities by up to 75%
  - 2 out of 3 groups saw reduction in POC activities
- When passengers rode in bus with 3-pt. belts moved to bus w.o. 3-pt. belts:
  - OOC activities also decreased but not where as dramatic
  - 2 out of 3 groups saw reduction in POC activities

Note: this result may be skewed because buses with 3-pt. belts were initially assigned to experienced drivers.
- Drivers with few discipline issues saw the least benefit from 3-pt. belt seats
- Driver's impression on passenger discipline reflect onboard OOC activity level
- Not possible to replicate this study for middle and high school-age passengers due to utilization issue



# Summary observations

- The number of partial “out-of-compartmentalization” incidents (POC - hands and legs in aisle) increased as the amount of time spent on the bus increased for the first half hour.
  - As the number of students on the bus significantly decreases, the number of partial “out-of-compartmentalization” incidents will decrease too (fewer students to interact with).
- The number of complete “out-of-compartmentalization” incidents during the first half hour seemed fairly consistent.
  - This might increase as the amount of time spent on the bus increases and the number of vacant seats on the bus increases.
- There were multiple “repeat offenders” of OOC

# NEW TECHNOLOGY – FLEX SEAT

## Cumberland County Pilot Project





# Training





# High School





# Maintenance Training



# Pilot Project Findings



- Thus far the FlexSeat works as advertised in addressing the capacity issue
- Child Fatality Task Force recognized that we do not have a problem with occupant protection in our school buses.

# Compartmentalization – Low Back Seats, Older Students





# Crash Protection Tests

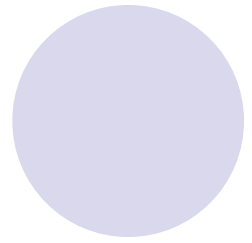
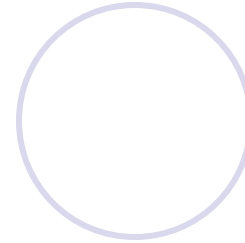
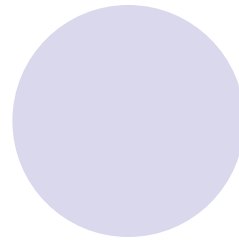
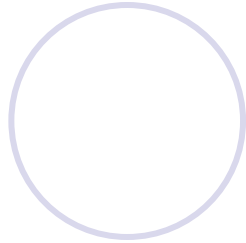
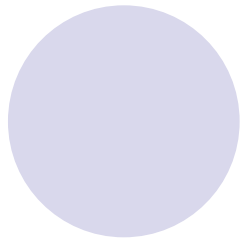
## Low Back Seats



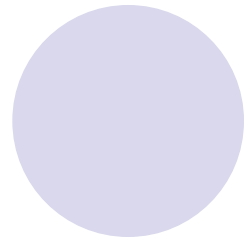
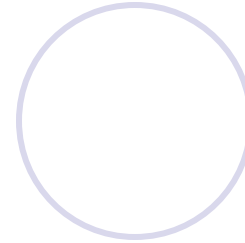
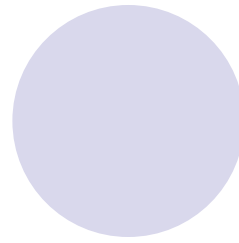
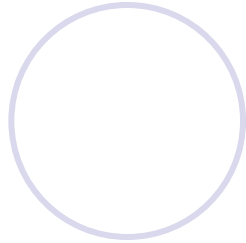
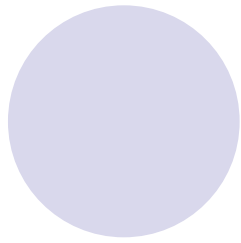
# High Back Seats – The Flip Side

- How many students can you see?

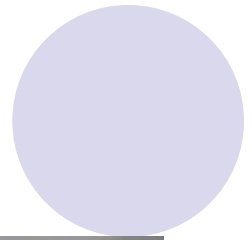
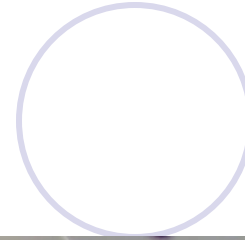
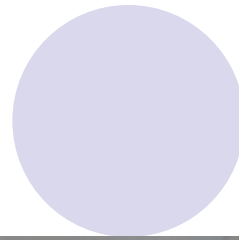
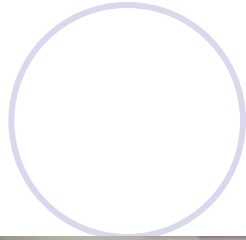
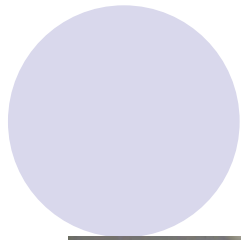
Series of pictures taken with camera resting on the top of the first row seat front crash pad behind the driver's seat – 32 inch C.E. White 3 Pt. Seat

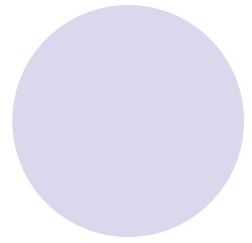
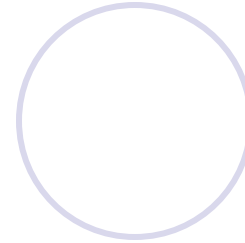
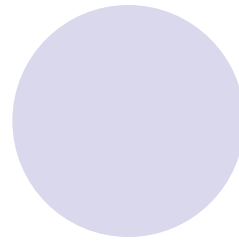
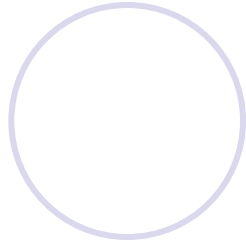
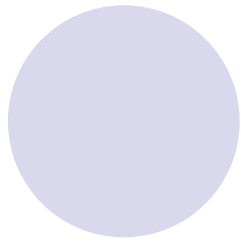
















Two 6<sup>th</sup> graders, one 2<sup>nd</sup> grade, and one kindergarten





# Notice of Proposed Rulemaking So.....Where Are We???

- Comments were due January 22
- In NHTSA's Court to Respond

# NASDPTS Response

- National Association of State Directors of Pupil Transportation Services
  - Commends NHTSA on high back seats, lap/shoulder belts on small school buses (question the GVWR), testing standards for lap/shoulder belts
  - Questions testing standards for lap belts
  - Requests separate funding from 402 funds
  - Encourages FUNDED requirement for lap/shoulder belts on large school buses

# NAPT Response

- National Association of Pupil Transportation
  - Compartmentalization works
  - Requests NHTSA to do additional testing on occupant protection
    - Would lap/shoulder belts ENHANCE SAFETY?
  - Supports seat back height
  - Ensure that we don't end up with fewer students riding school buses
  - Questions lap-only belt standards; questions rump room for lap/shoulder



# NSTA Response

- National School Transportation Association
  - Federal government should not issue lap/shoulder belt requirement
    - Unfunded mandate
    - States in best position to consider the issue
    - States and districts that affirmatively choose to equip their buses with lap/shoulder belts are more likely to provide the necessary support to ensure that students benefit from the equipment.
  - Supports seat back height; questions lap belt standards and lap/shoulder rump room
  - Encourages continued research



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