Vehicle Specifications 101 Webinar

July 26, 2018, 2:00 PM ET
Presenters

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Florida Department of Transportation

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Florida Department of Transportation
Presenters (cont.)

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Polls

What best describes your agency/company/organization?

• State agency
• Local government
• Small urban transit provider
• Rural transit provider
• Other (select Other and type answer into Questions box)
History of TRIPS

In response to concerns related to the overall condition of statewide transit agency fleets and the recognition that FTA Section 5310 program funds could be more efficiently utilized, FDOT created the Transit, Research, Inspection and Procurement Services (TRIPS) Program in 1995.

Program Goals of TRIPS

- Provide safe, clean, reliable, quality transit vehicles
- Ensure compliance with Federal and State purchasing requirements
  - Maximize the use of those funds
- Promote customer satisfaction
- Conduct research that enhances product performance
Staffing of TRIPS

- FDOT contracts with the Center for Urban Transportation Research (CUTR) at the University of South Florida to administer this program.
  - FDOT oversees and manages the program from the FDOT Headquarters in Tallahassee, FL
  - CUTR provides technical and administrative support from both Tampa and Tallahassee locations.
  - The second site in Tallahassee is FDOT's Springhill Facility. This facility houses three (3) full-time employees and serves as the program’s headquarters for vehicle testing, receiving, delivery, inspection; research and analysis (through our Crashworthiness Program at FSU), issue resolution and technical assistance.
Organization Chart

- TRIPS Program Oversight – FDOT Operations Administrator
  - FDOT Project Manager
    - CUTR Program Director
      - CUTR TRIPS Program Manager
      - CUTR TRIPS Assistant Program Manager
        - CUTR TRIPS Technical Specialist
        - CUTR TRIPS 5310 Administrative Specialist
  - FTA Funding and Compliance Oversight – FDOT Grant Programs Administrator
    - CUTR TRIPS Technical Specialist
TRIPS administers the vehicle contract management process through a six (6) step process:

1. Technical Specification Development
   - Springhill Technical Committee (STC) develops vehicle specifications. Specifications are developed using previous contract design criteria, recommendations from the Paratransit Maintenance Consortium, technology advancements, historical data and agency preference.
   - Editorial reviews are completed by the CUTR management staff and forwarded to FDOT for final approval.
Performance Standards

- Air Conditioning Pull Down Test
- Crashworthiness – Pre-Qualification and Full Scale Rollover
- Alternative Fuels Installation Standard
- Brake Performance Standard
- Emergency Brake Performance Standard
- Acceleration Performance Standard
- Charging System Performance Standard
- Amp Draw Performance Standard
- Electrical System Requirements – SAE Compliance
FDOT / TRIPS
Crashworthiness and Safety Assessment of Cutaway Buses
Introduction

The Crashworthiness and Impact Analysis Laboratory (CIAL) located at the FAMU-FSU College of Engineering in Tallahassee, Florida has been conducting cutaway bus crashworthiness research and testing for more than 15 years.

“Springhill” is a FDOT facility located on Springhill Road in southwest Tallahassee, FL and used as the headquarters for the TRIPS Program. Every vehicle ordered through TRIPS passes through Springhill where it is given a detailed final inspection. Crashworthiness testing is also primarily conducted at Springhill using a variety of test apparatus that has been designed and constructed by CIAL.
Motivation

Cutaway buses are constructed using a two stage build process and often have Gross Vehicle Weight Rating (GVWR) exceeding 10,000 lbs. In combination, these two factors exempts them from most federal safety standards.
Goal

To continually improve the passenger safety of all cutaway buses purchased through FDOT/ TRIPS contracts.
Vehicle Safety

Active Safety (intended to prevent an accident from occurring)

- Vehicle dynamics
- Vehicle systems (ABS, TPMS, EBD, TCS, …)
- Driver comfort / conditions
- Vision / lighting / cameras
- Wiring specifications
- Interlocks
Vehicle Safety

Passive Safety (intended to protect occupants in an accident)

- Body structure
- Head restraints
- Seatbelts
- Emergency exits
- Interior design / padding
- Safety glazing
- Airbags
Testing and Standards

Quasi-static tests, such as FMVSS 220 (School Bus Rollover), have the advantage of being easy to perform and providing greater repeatability of results. They do not, however, resemble real accident conditions.

Dynamic tests, such as the ECE R66 motorcoach rollover test, are better representations of real accident conditions.
FDOT/ TRIPS Crashworthiness
Performance Standards

Structural standards that primarily intend to reduce passenger injury by preventing collapse of the passenger compartment during rollover accidents.

- **PRE-QUAL** – Documentation of build methods and quasi-static testing of passenger compartment frame sections. Frame sections must exceed energy dissipation thresholds in order to pass.

- **FL-STANDARD** – Tilt Table rollover of fully loaded bus. The passenger compartment frame of the vehicle must have sufficient strength to ensure that no part of the vehicle outside the survival space at the start of the test will intrude into the survival space at any time during the test.
The purpose of the PRE-QUAL inspection and testing is to document the design and assembly methods of the particular bus model while also ensuring it has a minimum level of structural integrity. PRE-QUAL must be completed before first build for all cutaway buses acquired through FDOT/ TRIPS contracts.

The manufacturer is required to provide assembly drawings, a full passenger compartment frame consisting of only structural tubing, and one skinned sidewall panel.
PRE-QUAL testing video:

- Video speed is faster than real-time.
- The first pair of tests is the floor to wall connection.
- The second pair of tests is the roof to wall connection.
- The last test is panel impact (16ga tubing on top, 18ga on bottom).
FL-STANDARD Tilt Table Rollover

The test is performed by placing a prepared bus on a tilt table which then rotates bus to point of unstable equilibrium and allows the bus to fall under its own weight 31.5” onto a flat concrete slab.

Pass-fail criteria for the rollover test is based on the concept of Survival Space which is a three-dimensional volume defined within the passenger compartment. In order for the bus to gain approval, the Survival Space cannot be compromised.
FL-STANDARD Tilt Table Rollover

FL-STANDARD testing video:
- Video speed is variable depending on the clip.
- Two rollovers on nearly identical bus models are shown.
- The second rollover illustrates how easily an unbelted passenger can be partially ejected.
- The final side by side portion compares a bus that had not passed PRE-QUAL with one that had.
The dolly rollover test is intended to be more representative of what occurs in "real world" rollovers. This test was conducted at CAPE/IMMI located in Indianapolis, IN.

The bus is loaded on a sled which accelerates to 25 mph before being rapidly stopped.

ATD (test dummy) passengers were included to study injury differences between passengers wearing:

- 2 point seatbelt
- 3 point seatbelt
- No seatbelt
Dolly Rollover Research Test

Dolly rollover testing video
Dolly Rollover Research Test

During the Dolly rollover the 2 pt. belted ATD experienced more severe head injury than the 3 pt. belted ATD - likely due to greater movement of the upper torso allowed by the 2 pt. seatbelt.
The two major sources of severe injury in rollover or side impact accidents are:

- Ejection / partial ejection
- Head / thorax injury

Side airbags address both but must cover glazing and remain inflated while being robust enough to prevent ejection.

Airbag design and engineering likely exceeds capabilities of all second-stage builders.
CIAL Injury Mitigation Research - Side Airbag

Dolly rollover testing video
2. Request For Proposal Development

- FDOT and CUTR Project/Program Managers review entire RFP document for compliance, including:
  - Required Certifications
  - Proposal Evaluation Criteria
  - Training
  - Options
  - Service After the Sale Criteria
  - Warranty Provisions
  - Multiple Awards

- Establish RFP Review Committee

- Final RFP Package is reviewed and approved by FDOT
3. RFP Release Process
   - Public Notification and Industry Advertisement
   - Pre-Bid Meeting Notification
   - Amendments to the RFP
   - Receive Proposal Submissions
4. Proposal Review and Negotiation Process

- Review Proposals to determine responsiveness, review federal pre-award certifications, check the Excluded Parties List System (EPLS) and FTA’s Transit Vehicle Manufacturer (TVM) list
- Identify and seek responses for points of clarification (POC)
- Establish Pricing Competitive Range/Product negotiation
- Request Best and Final offers (BAFO)
- Score proposals
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**Note:** Black = Buyer agrees with pricing / last negotiated
Underline = purchased from list supplier
Red = new offering / sled negotiated

BPAI Second Stage includes A/C, Beat WC11L, and Beat Fire Suppression System.
5. **Contract Award Process**

- Issue Notification of Intent to Award
- Create Bilateral Agreement
- Issue Offer and Award letter
- Prepare and post contract documents for website, including the order form and all applicable certifications
6. Annual Contract Maintenance Process

- Process price escalation provisions
- Re-certify EPLS and TVM
- Options Review and Additions
- Manufacturer submits re-certification of Buy America
- FDOT issues contract extension
- Update TRIPS website
Vehicle Orders

The vehicle order process is a primary program activity of the TRIPS Program.

Vehicle Order Steps

- Transit agency submits all orders to CUTR
- Vehicle order is compared to original award issued by FDOT District and matching funds are confirmed
- Order is prepared and entered into the TRIPS DataCenter
- Order is submitted to FDOT for final review of contract compliance and the assignment of purchasing codes
- FDOT completes a purchase order in MyFlorida Marketplace
Vehicle Inspection

Vehicle inspections are an integral part of the TRIPS Program’s overall mission.

Inspection Steps

- CUTR schedules and coordinates vehicle inspections
- Multi-point inspection occurs at the Springhill Facility in Tallahassee, FL
- Performance test are conducted
- Post-delivery Buy America compliance is reviewed
- Information is entered into the DataCenter:
  - Post-inspection report is generated
  - Post-delivery audit is generated that includes Buy America, Purchasers Requirements, and Federal Motor Vehicle Safety Standard (FMVSS) self-certifications
- If defects are found, the dealers are responsible for making the necessary repairs prior to agency delivery
Service After the Sales

3 Step Approach

- **Mechanical Issues**
  - TRIPS troubleshoots contract related mechanical issues, such as fleet defects and warranty claims.

- **Maintenance Management**
  - FDOT contracts with Florida State University to provide technical assistance to transit agencies in the form of maintenance.

- **Quarterly Meetings**
  - TRIPS conducts quarterly meetings with contracted manufacturer’s and dealers.
Questions?

TRIPS Website
http://www.tripsflorida.org/index.html

CIAL Website
http://eng.famu.fsu.edu/cial/
Thank You!

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Recording and slides will be posted at nationalrtap.org/webinars within one week. Transcripts can be made available upon request.