



# Bus Research and Testing Center

Enhancing the quality, safety, and efficiency of transit vehicles, operations, and components through research, testing, and education

The Bus Research and Testing Center (BRTC) was established in 1989 with funding provided by the Federal Transit Administration (FTA). One of four research centers operated within the Thomas D. Larson Pennsylvania Transportation Institute (larson.psu.edu), the BRTC houses eight bus maintenance and test bays and is fully equipped to perform heavy vehicle testing, maintenance, and repair.



In 2011, the center was accredited for ISO/IEC-17025 by the American Association for Laboratory Accreditation (A2LA).

# #1



**FIRST INDEPENDENTLY OWNED** testing facility approved by the FTA in the United States currently capable of federal bus testing.

# 15<sup>+</sup>

Equipped to test more than a dozen buses at a time.

# 500<sup>+</sup>



Buses tested over 30 years



# 576<sup>+</sup>

Failures prevented during testing of more than 30 low- and zero-emission buses.

The BRTC has extensive experience and is currently equipped to test low- and zero-emission buses.

# 25%

of bus models tested show significant design deficiencies identified by the program.

# 10,000<sup>+</sup>

Problems, design deficiencies, and structural failures identified by testing that would have resulted in hundreds of fleet failures, thereby averting extensive repairs and costly retrofits.

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Testing conducted at the BRTC has saved transit industry agencies and bus original equipment manufacturers hundreds of millions of dollars in repair costs, loss of service, loss of revenue, and liability costs.

**Real-world savings:**

Recent testing of an advanced heavy-duty bus revealed structural deficiencies that resulted in extensive structural cracking. The manufacturer withdrew the bus from testing to make design changes.

If the original design had gone into production, more than 500 buses with this defective design would have gone into revenue service. A fleet failure of this size and severity would have required extensive retrofitting and rebuilding of each bus—resulting in lost revenue and litigation, costing tens of millions of dollars!



**The center tests full-size, heavy-duty transit buses, mid-size buses with commercial chassis, and modified minivans for:**

- Safety (brake performance, lane change stability)
- Structural integrity
- Durability
- Performance
- Maintainability
- Noise
- Fuel economy
- Emissions

**The center is equipped to test and repair a wide range of vehicles including those fueled by:**

- Gasoline
- Diesel
- Compressed natural gas
- Liquefied natural gas
- Methanol/ethanol
- Propane
- Battery-electric
- Hybrid-electric
- Fuel-cell

For more information about bus testing, visit [altoonabustest.psu.edu](http://altoonabustest.psu.edu) or contact David Klinikowski at [dxk6@psu.edu](mailto:dxk6@psu.edu) or 814-863-1898.

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