

CUSTOMIZATION, COMPETITION, AND COSTS:

Findings and Recommendations for the
U.S. Transit Bus Industry

APPENDICES



This document contains the following appendices:

Sources Consulted (List of Interviewees and Bibliography)

Bus Industry Background

Background on Federal Procurement of Transit Buses

Pricing Analysis

Appendix 1. Sources Consulted

List of Interviewees (by Organizational Affiliation)

A wide range of transit operators were interviewed, including representatives of Alameda-Contra Costa Transit District; Champaign-Urbana Mass Transit District; Greater Cleveland Regional Transit Authority; Chicago Transit Authority; Foothill Transit; King County Metro; Los Angeles County Metropolitan Transportation Authority; the Town of Lexington, Massachusetts; Maryland Transit Administration; Massachusetts Bay Transportation Authority; New York's Metropolitan Transportation Authority; New Jersey Transit; Pinellas Suncoast Transit Authority; San Francisco International Airport, Transdev, and the Washington Metropolitan Area Transit Authority.

The team also interviewed representatives from bus manufacturers and suppliers, including Clever Devices; Gillig; New Flyer; Nova Bus; and PhoenixEV. In addition, the research team spoke with representatives from organizations involved in transit policy, procurement, labor, research, and industry practice, including AECOM, Amalgamated Transit Union; American Public Transportation Association; Bus Research and Testing Center; Canadian Urban Transit Association; Center for Transportation and the Environment; Harvard University; HNTB Corporation; International Association of Public Transport; The Bus Coalition; and Washington State.

Furthermore, the team interviewed current and former U.S. government officials and staff, including representatives from the Federal Transit Administration and the U.S. Department of Transportation; the U.S. Government Accountability Office; a former official from the Office of Management and Budget; staff from the U.S. Senate Committee on Banking, Housing, and Urban Affairs; a former acting Federal Transit Administration administrator; and a former Senate counsel.

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Appendix 2. Bus Industry Background

The bus manufacturing industry faces challenges related to industry consolidation, supply chain constraints, and increased costs. To address these challenges, the FTA, APTA, and other organizations have issued recommendations to improve the health of the industry to ensure continued supply of transit buses.

This appendix provides insights into the historical growth of the U.S. transit bus manufacturing industry and contemporary challenges faced by the industry. It contains sections on (i) historical background, (ii) contemporary bus industry, (iii) technology and innovation, and (iv) new entrants to the U.S. bus market.

i. Historical Background

During the 1930s, the bus industry was dominated by five major manufacturers: General Motors, Fageol Twin Coach, Mack Trucks, A.C.F. Brill, and White Motor Company. A wide variety of models were produced for both the intercity and transit markets. Between 6,000 and 8,000 buses a year were sold in the U.S. in the late 1930s and early 1940s. Their models became the prototypes of the modern transit bus: an entrance doorway opposite the driver and ahead of the front axle with the second door in front of the rear axle, engine and transmission at the rear.

During the 1950s, bus sales plummeted as the personal automobile became the predominant mode of transportation. The number of major U.S. transit bus manufacturers dropped from five in 1951 to two in the 1960s. General Motors and Flxible produced nearly identical "New Look" buses throughout the 1960s. These buses were utilitarian with an emphasis on durability.

In the 1970s, major increases in federal transit funding began with the Urban Mass Transportation Assistance Act of 1970, which provided \$10 billion over twelve years for mass transit. This inspired a great deal of interest in the transit equipment manufacturing industry. Rohr bought the Flxible Company. Likewise, AM General (a subsidiary of American Motors Corporation) bought the rights to produce a transit bus design from Flyer Industries (a Canadian bus manufacturer). In 1975 three firms -- Flxible, AM General and GM -- had about one-third of the market.

In 1980, approximately 2,000 intercity buses, 4,000 transit buses, and 31,000 school buses were built in the U.S. each year. In general, integral construction was used for transit buses where the manufacturer assembles both the chassis and body of the bus. These manufacturers purchased engines and other components for their buses.

In the 1980s, more firms entered the transit bus industry. Manufacturers during this period included Bus Industries of America (Orion), Blue Bird Body Company, Carpenter Body Works, Chance Coach, Diesel Division of GM of Canada, Flxible, New Flyer Industries, Gillig Corporation, GM, Ikarus, Motor Coach Industries, National Coach Corporation, M.A.N., Neoplan, Saab- Scania of America, Skillcraft Industries, SuperBus, Thomas Built Buses, Transportation Manufacturing Corporation (a division of Greyhound), and Volvo.

In the 1990s, changes continued in the industry, with Flxible, once the dominant U.S. manufacturer, going bankrupt in 1996. In 1994, Motor Coach Industries sold its Transportation Manufacturing Corporation facility to Nova Bus. Consolidation continued over the next two decades.

In a 2015 report, the U.S. Government Accountability Office (GAO) reported that the number of firms producing most heavy-duty transit buses had declined from ten in 2004 to four in 2013 even though bus production remained constant. From 2009 to 2013, federal investment in transit buses increased from \$794 million in 2009 to \$1.3 billion in 2013 along with \$1.7 billion through the Recovery Act in 2010. In 2013, four manufacturers: Gillig Corporation, New Flyer Industries, North American Bus Industries Inc., and ElDorado National, accounted for 68 percent of transit bus production.

This market consolidation occurred through mergers, shutdowns, and acquisitions. In 2013, New Flyer acquired NABI. Most manufacturers that stopped producing heavy-duty buses between 2004 and 2013 were relatively small, with each making 4 percent or fewer of the 2004 reported buses, although one manufacturer made 11 percent.

Although the number of heavy-duty transit bus manufacturers had plummeted, almost all cutaway bus manufacturers were continuing to produce buses— of the 13 largest manufacturers in 2004, all continued to produce transit buses in 2013. (For cutaways, many are initially developed for commercial use and then are adapted for transit uses.)

For its 2015 report, GAO was able to identify bus manufacturers, the number of buses produced, and changes over time, by reviewing the National Transit Database (NTD) urban vehicle inventory reports from 2004 and 2013. (Transit agencies receiving federal grant funding from FTA were required to report operating information to NTD, including detailed information on their bus fleet.)

In 2019, the largest bus manufacturers were Gillig and NFI Group (parent of New Flyer) which accounted for approximately 75 percent of all buses (not including cutaways) that had been identified in the National Transit Database in recent years. Other providers

were REV Group (parent of El-Dorado and other brands), Volvo (parent of Nova Bus), and some smaller companies. Annual sales ranged between 8,000 and 9,000 buses: sales were roughly split between models 30 feet or longer and shorter buses (e.g., cutaway buses that were frequently used for paratransit services).

Figure A-1 displays the contraction in the number of bus manufacturing companies from 2008 to 2023. By 2023, 12 companies were manufacturing transit buses (down from a high of 41 in 2009); 4 companies were manufacturing more than 20 transit buses (down from a high of 21 in 2010); and 3 companies were manufacturing more than 100 buses per year (down from a high of 11 in 2012).

Figure A-1. Significant Contraction in Number of Companies

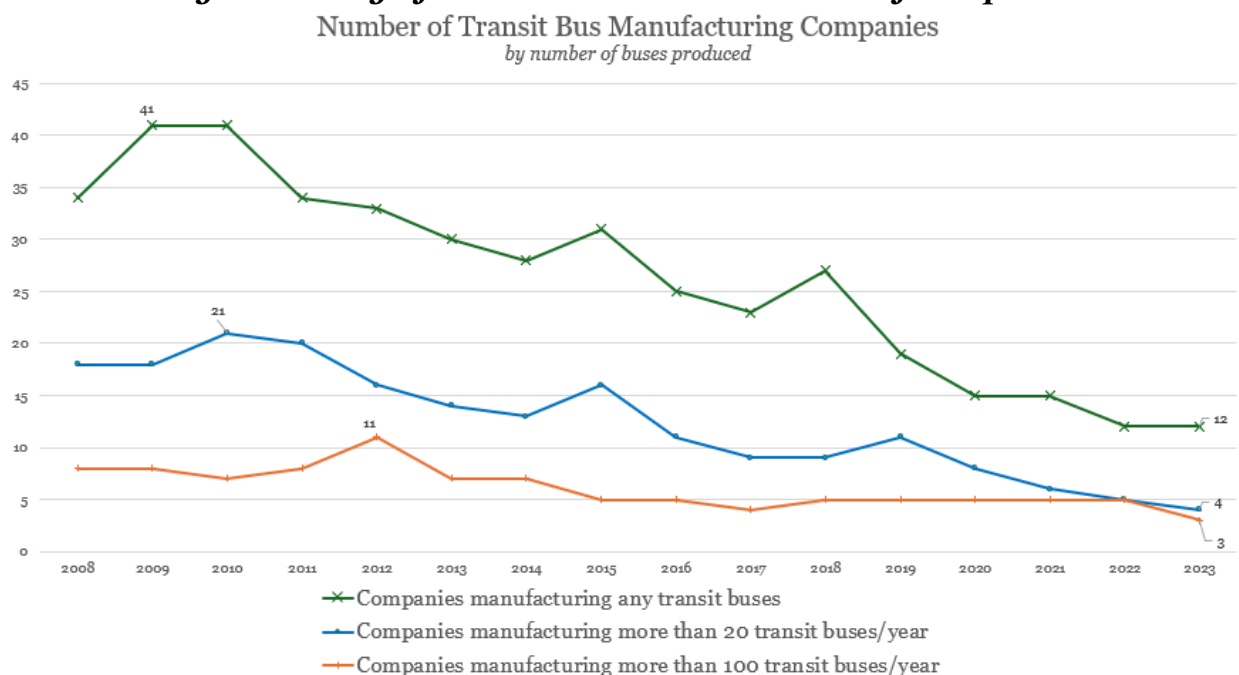
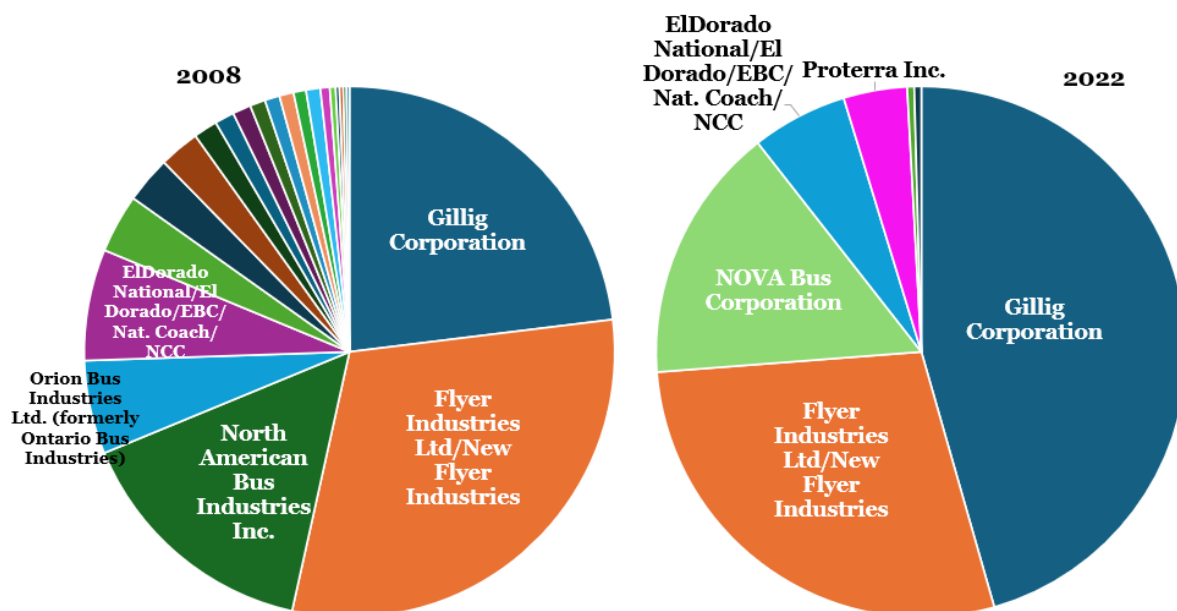


Figure A-2 compares transit bus market share by manufacturer between 2008 and 2022. The pie chart on the left shows a more fragmented market in 2008, with transit bus production divided among a larger number of companies. The pie chart on the right shows a more concentrated market in 2022, when Gillig Corporation and New Flyer accounted for a much larger share of transit bus production.

Appendix Figure A-2. Contraction in number of bus manufacturers



In the early 2020s, coinciding with the COVID pandemic, a number of factors weakened the bus manufacturing industry. These included labor market tumult, hyperinflation in material and component prices, commodity shortages, hardships by many parts suppliers, and the significant increase in the cost of capital. As of 2024, there were only two major manufacturers: Gillig and New Flyer.

In April 2025, Eldorado National California Inc. (ENC) announced it was resuming production. The move followed a temporary pause in operations in late 2024 during an ownership transition. Previously owned by REV Group, the company is now operating under Rivaz Inc. Nova Bus is owned by Volvo and based in Canada. It reentered the U.S. market in 2009 when it opened its Plattsburgh, New York manufacturing plant. While Nova Bus still participates in the U.S. market, it closed its U.S. plant in 2025 so is no longer Buy America eligible.

Gillig can produce 1,800 buses annually at its California plant, and it is the only U.S.-owned manufacturer of the big three. New Flyer is a publicly traded company based in Canada. 70 percent of its sales are from the U.S., and it ships components of its buses to the U.S. for final assembly.

ii. Contemporary Bus Industry

The contemporary bus industry has been marked by a decade of changes from consolidation (as described above), cost increases (which is further explored in the cost

analysis), and technology advancements including new propulsion options. These shifts are significant for transit agencies as buses are a major component of transit agency capital expenses. In 2023 transit agencies spent nearly \$6 billion on transit buses, almost a quarter of total capital expenditures.

Transit buses are designed for frequent stops with relatively low floors (to make them more accessible), wider aisles, a second door to permit faster loading and unloading of passengers, and poles and straps for standees. The bus industry makes several other types of large buses. Intercity buses are designed for lengthy trips with high floors to allow for luggage compartments, narrow aisles, full-backed seats, luggage racks and a toilet. Suburban buses, a hybrid of intercity and transit buses, typically have luggage racks, but not side doors. Special purpose buses are used for services such as airport shuttles and sightseeing. The most ubiquitous type of bus, school buses, are notable for their extremely utilitarian design.

Moving from start to finish, the bus manufacturing process typically involves design and engineering, material procurement, body manufacturing, chassis manufacturing, painting and coating, interior and exterior assembly, testing and quality control, and final inspection and finishing. During the process, manufacturers must take into consideration federal regulations including those related to emissions standards, accessibility, maximum weight, crash safety and stability, maximum dimensions, and fuel consumption.¹

The following graphs were created with data from the National Transit Database² and APTA's Public Transportation Vehicle Database.³ The price data represented in the charts are nominal; they are not adjusted for inflation. (Note that the research team's pricing analysis did adjust bus costs for inflation, as noted in Section 5 of the report and further discussed in Appendix 4). Analysis of nominal cost of transit buses from 2014 to 2025 reveals an average overall increase in costs of transit buses, both diesel and electric. This data also reveals that transit agencies are paying varying amounts for transit buses.

Figure A-3 shows the minimum, maximum, and average price range for 40' diesel buses and 40' electric buses. For diesel buses, for most years there is at least a range of \$200,000 between the minimum and maximum costs. For 40' electric buses, the price ranges have expanded over time. For both diesel and battery-electric buses, the average price has increased over time. According to a 2020 CTE report, zero-emission buses can cost twice as much as diesel counterparts. According to this same report, coordination of bus replacement cycles and funding availability will help to better commercialize zero-emission buses.⁴

The research team’s pricing analysis further explores cost trends in the U.S. bus manufacturing industry.

Figure A-3. Bus Prices Over Time and by Propulsion Type



iii. Technology and Innovation

According to the existing literature, new technologies such as electric vehicles, autonomous vehicles, and ITS technologies bring about opportunities for innovation and improvement to transit bus networks. However, the literature also highlights the new procurement challenges and risks created by evolving markets, technologies, and proprietary technologies.

According to the Volpe Center’s 2021 report, “Creative Procurements to Improve Transit Cost and Effectiveness,” agencies are careful to follow federal regulations and therefore may be slow to adapt to new procurement processes or technologies. Additional issues raised by transit agencies in relation to procurement of emerging technologies included system malfunctions, interoperability issues, slow production times, and replacement of rapidly evolving technologies.⁵

In terms of components like batteries, fare card readers, and cameras, the FTA says transit agencies must consider if these items should be procured separately from vehicles to ensure standardization across the vehicle fleet. Agencies must also consider if they want to work directly with the technology provider or through the vehicle manufacturer. According to the Volpe report, transit agencies may want to utilize procurement strategies “in which the same contractor team designs the system, procures, or purchases the equipment, develops needed software, and installs and potentially integrates the equipment.”

The Volpe report also suggested that the FTA develop best practice documents on the adoption of advanced technologies and procurement method tradeoffs, along with clear and timely updates to all guidance documents.⁶

A major challenge with the rapid increase of new technological components is interoperability. There are some baseline technology standards utilized by the industry. However, ITS elements in buses encourage customizations as transit agencies must ensure that their components are interoperable. Both the selection of ITS components and their arrangements can be customized by agencies. According to the 2021 Volpe Center report, the transit bus industry may benefit from specifications to encourage volume purchasing of new technologies.

Table A-1 provides examples of existing technology standards within the transit bus industry, the organization that developed the standards, and their use.

Table A-1. Transit Bus Industry Technology Standards

Standard Name	Organization	Use
SAE J1708 and SAE J1939	SAE International (formerly the Society of Automotive Engineers)	Defines physical wiring and data link layers. And, also protocols for communication and diagnostics among electronic control units in buses.
GTFS (General Transit Feed Specification)	MobilityData	Shares schedule and real time information.
NEMA 4	National Electrical Manufacturers Association (NEMA)	Design for products to withstand temperatures, shock, and vibration.
NTCIP (National Transportation Communications for Intelligent Transportation Systems Protocol)	NEMA, AASHTO, and ITE	Enable signals, signs, and sensors to talk to each other, ensuring interoperability in Intelligent Transportation Systems.

iv. Challenges Facing the Bus Industry

The bus manufacturing industry's financial challenges have contributed to the loss of manufacturers, reducing competition in the market for public transit buses and

increasing wait times to purchase these vehicles. The FTA has also raised concerns about the health of the transit bus manufacturing industry. During its best practices webinar in 2024, the FTA identified challenges facing the bus manufacturing industry including inflated component costs, long procurement and payment timelines, and high levels of customization. According to the FTA, these challenges have threatened the ability of transit agencies to procure buses as many manufacturing facilities have closed and there has been a backlog of bus orders.⁷

According to the 2016 report, “The U.S. Transit Bus Manufacturing Industry,” transit agencies have mixed viewpoints on the size of the industry. Some transit agencies interviewed for the report thought the size of the industry was appropriate to the size of the market and there were still enough manufacturers to support competition. (At the time there were three major manufacturers: Gillig, New Flyer, and Nova Bus). Transit agencies also highlighted the impact of favorable foreign exchange rates on the likelihood of foreign manufacturers entering the U.S. market.

Other transit agency interviewees expressed concern that the market was “small and fragile” and raised concerns about being able to maintain competitive procurements for major subsystems such as engines, transmissions, doors, and seats. Agencies were also concerned by manufacturers going out of business because that would make it harder to support maintenance and replacements for vehicles that needed to have a 12-year lifespan.⁸

v. New Entrants to the U.S. Bus Market

Compliance with Buy America requirements, including having domestic final manufacturing and 70 percent of components domestically sourced, shapes the business models of existing manufacturers. Manufacturers seeking to enter the U.S. market must have the up-front capital to support domestic manufacturing and build out a domestic supply chain in order to compete for FTA funded bus dollars.

U.S. transit manufacturers interviewed in the 2022 dissertation “U.S. Buy America Trade Legislation and the Impact on U.S. Transit Vehicle Manufacturers” said that while Buy America has helped to bring jobs and manufacturing to the U.S., it has also increased costs and slowed technology advancements. Manufacturers emphasized the importance of protecting domestic industry and their initial capital investments while also balancing cost increases and innovation.

A significant percentage of interviewees also raised concerns about remaining manufacturers potentially leaving the U.S. industry. However, manufacturers said that as long as they are able to charge enough to make up for the additional costs of

operating in the U.S. market, they plan to stay in the market. Manufacturers who had left the market cited high costs and inefficiencies in producing in the U.S. market and a lack of large customer orders.⁹

The 1978 Surface Transportation Assistance Act first established the domestic content requirements for transit and rail manufacturing. According to the 2022 dissertation, this led some large international manufacturers to establish manufacturing in the United States. While this was the intention of the legislation, it also may have conversely pushed smaller U.S. manufacturers out of the market who could not compete with the larger international players.

Buy America requirements create a trade-off for taxpayers. On the one hand, Buy America requirements incentivize the domestic manufacturing of and purchasing of domestic components for transit vehicles, which are primarily purchased with taxpayer dollars. However, these requirements result in cost increases and inefficiencies as U.S. manufacturers cannot tap into global supply chains with cheaper materials and efficiencies, and limited material supply creates uncertainty.

Limited access to international competition may also reduce innovation. The increased costs of Buy America requirements are ultimately passed on to transit agencies. The requirements also limit competition within the U.S. due to the high upfront capital investments required to enter the market. This limited competition may also reduce price competition between manufacturers.¹⁰

The risks of not winning a substantial number of FTA-funded contracts can create feast or famine scenarios for businesses. The delayed payment schedules and potential for liability built into terms and conditions also place financial strain on the companies.

Companies seeking to enter the U.S. market want to have some certainty of business before building manufacturing facilities. But before they can win contracts, they must build their facilities and go through Altoona testing. To get around this, some companies seeking to enter the U.S. market have instead sought out non-FTA funded contracts to avoid Buy America requirements.¹¹

Companies seeking to enter the U.S. market must also take into consideration the limitations in the size of the market. Globally, particularly in the Asia-Pacific region, transit services continue to grow as metropolitan population sizes grow. Of the global transit ridership market, the U.S. and Canadian markets remain relatively small. In 2017, Asian transit systems carried more than 26 billion passengers a year; European lines carried more than 10 billion passengers; Latin America nearly 6 billion, and North America (U.S. and Canada) just 3.7 billion.¹²

In the U.S., Buy America protects domestic manufacturers from a market that globally is dominated by multinational manufacturers. U.S. manufacturers have expressed concerns that changes in Buy America requirements, whether an increase or decrease in requirements, could create disruptions to their business models.

Appendix 3. Background on Federal Procurement of Transit Buses

Federal funding rules and procurement requirements shape how transit agencies buy buses, affecting costs, competition, delivery timelines, and the health of the bus manufacturing industry. Based on the research team's literature review, this appendix includes: (i) federal funding challenges, (ii) lowering procurement costs, and (iii) selected policy initiatives and recommendations.

i. Federal Funding Challenges

Existing literature identifies a number of challenges experienced by transit agencies and manufacturers in the procurement process. According to the 2016 U.S. Transit Bus Manufacturing Industry report, manufacturers interviewed said that the short-term nature of funding for bus purchasing can disrupt production schedules and create uncertainties for both manufacturers and transit agencies. Some transit agencies also felt as though the federal government is underfunding the bus replacement program.

The report noted that the structure of federal funding incentivizes large, infrequent procurements rather than smaller, more frequent procurements which some transit agencies prefer, especially larger agencies that have the staff for more frequent procurements. Procuring every two to three years can enable continual renewal of fleets but also may result in greater variation between vehicles.¹³

Challenges experienced by transit agencies interviewed by the GAO for its 2015 report included outdated FTA guidance, Buy America requirements, and prohibitions on multiyear rolling stock contracts for longer than five years. Study participants identified limited competition in the manufacturing of heavy-duty buses and limitations (some due to regulations like Disadvantaged Business Enterprise and Buy America) in the selection options for component vendors. Participants also identified funding challenges such as limited state and local budgets and year-to-year uncertainties around federal authorizations and appropriations.¹⁴

Many transit agencies struggle to meet FTA requirements due to agency staff capacity limitations, creating delays in the procurement process. These limitations may reduce the likelihood of transit agencies taking on creative procurements. Most transit agencies rely on federal funding and thus must set their procurement schedules around the availability of federal funding and the useful life of their vehicles. For smaller agencies reliant on competitive grant funding, this can mean unpredictability in replacing vehicles. Agencies may be disincentivized from pursuing new technology offerings.¹⁵

The Volpe report, “Creative Procurements to Improve Transit Cost and Effectiveness,” found that agencies are careful to follow federal regulations and therefore may be slow to adapt to new procurement processes or technologies. The report emphasized the need for federal resources to stay up to date to support local agencies, including potentially providing national guidance for agencies on the tradeoffs between different types of procurement methods. The report also suggests the development of best practice documents on advanced technologies’ adoption and clear and timely updates to all guidance documents.¹⁶

ii. Lowering Procurement Costs

The literature identifies existing opportunities for efficiencies and enhanced outcomes in the competitive procurement process including procurement best practices, use of APTA’s White Book, purchasing off a state schedule, and utilizing joint procurements.

FTA Best Practices Guidance

The FTA’s 2016 “Best Practices Procurement & Lessons Learned Manual” has sections on planning, selecting type of contracting method, evaluation of proposals and contract award, and contract administration. In terms of planning, the report emphasizes the importance of internal organizational capacity including having at least one experienced staff member such as a Chief Procurement Officer, Contracting Officer, or Contract Administrator oversee the entire procurement cycle through identification of need, procurement planning, preparation of specifications, solicitation of offers, communications, evaluation of offers, and administration.

It is also important for there to be internal checks and balances, with distinct representatives for the needs requirement, procurement, and payment activities. Investing time in short and long range plan procurement plans, establishing standards of conduct, and organizing are important for effective procurements. Common difficulties seen in procurement have included difficulties in achieving full and open competition. The guidelines say that agencies in procurement planning must aim to achieve the “Best Buy”, which involves evaluating the agency’s service, safety, cost, quality, schedule, and other priorities.¹⁷

Best Buy and Value Engineering

FTA advocates for “Best Buy” procurements in which the aim of full and open competition is to obtain the best quality of goods for the lowest prices. The FTA acknowledges that there are situations in which a recipient needs a specific named

brand product but encourages them to allow multiple vendors to compete to supply that product.

Under performance-based procurements, agencies procure based on performance-based standards as opposed to technical specifications, enabling for more widespread competition and potential innovations. Performance-based standards place responsibility on the contractor to select and design bus components.¹⁸

Joint Procurements and State Schedules

As discussed in this report, aggregation can be an effective way to reduce cost and time in bus procurements.

According to the FTA, joint procurement can lower procurement administrative costs and support the development of more standardized vehicles. Barriers to joint procurements include coordinating the timing of funding availability and bus replacement schedules across multiple transit agencies; differing state and local regulations and transit agency specifications; and creating a vehicle specification that meets or is easily configurable to the needs of the transit agencies.¹⁹

The FAST Act extended the reach of state contracts, enabling transit agencies to purchase off of schedules created and managed by states outside of their own. While state schedules provide base models, a certain level of customization is still allowed. Procuring from state schedules can ease the workload of transit procurement staff, reduce administrative expenses, expedite bus orders, lower costs due to volume discounts, help to compare pricings and specifications, and help agencies meet federal requirements.²⁰

The Washington state contract, administered by the Washington Department of Enterprise Services (DES), provides specifications that all bidders must meet. These include Altoona testing, SAE standards, Americans with Disabilities Act (ADA), Buy America, worker and protective measures, road testing, weight, maintenance and inspection. The contract also includes requirements for service, warranties, and delivery specifications. Bidders must demonstrate substantial compliance with the requirements even if 100 percent compliance is not possible and must also document material modifications. Bidders must also provide pricing information including for the standard bus model, options pricing, delivery costs, parts and volume discounts, and warranties.

Washington State's contract portal provides a dropdown menu of options for buses of multiple propulsion types. Bidders are allowed to add component options and warranties. Agencies can also request customizations. In total in the current light/medium duty contract there are 27 different option categories including heating,

ventilation, air conditioning (16 options); accessory options (22 options); and seating options (41 options). For heavy duty vehicles there are 64 different option categories including intelligent vehicle network (14 options), transmission (15 options), and fuel (10 options).

White Book

In the mid-1970s, UMTA (Urban Mass Transit Administration, the FTA's predecessor) saw the need to develop standard solicitation specifications in a way that preserved competition and permitted procurement of advanced design buses that were being developed by GM and Flxible. In 1977, UMTA developed a model bus procurement solicitation, referred to as the White Book, with a full set of functionally defined specifications, including a set of price offsets for the evaluation of bids which included certain specific, desired features.

Although the White Book was intended to be a mandatory standard for procuring advanced design buses, many transit agencies were not satisfied with the specifications, particularly those relating to passenger capacity, fuel economy, brakes and transmissions. UMTA gradually phased out certain White Book requirements and by 1982 no longer required its use. The official name for the current version of the White Book is the "APTA Standard Bus Procurement Guidelines." It is published by the American Public Transportation Association (APTA) and was first developed in 2008.

In 2025, APTA released an automated version of its White Book, enabling transit agencies to select White Book options on a spreadsheet to then merge into a set of contract documents.²¹ The White Book provides agencies with standard language they can utilize when conducting RFPs for bus procurements for both technical specifications and terms and conditions (such as guidelines for warranty requirements and quality assurance). The document helps to ensure that procurements are aligned with federal requirements and maximize ease for both the agency and contractor.

iii. Selected Policy Initiatives and Recommendations

This section refers to four initiatives. First, it discusses the 2024 White House roundtable on the bus manufacturing industry organized by the FTA and APTA. Second, it discusses the subsequent FTA Dear Colleague Letter and recommendations that were issued after the roundtable. Third, it explores the recommendations from APTA's Bus Manufacturing Task Force 2.0 focused on customization. Finally, it describes 2015 Government Accountability Office recommendations for procurement process improvements.

White House Meeting

On February 7, 2024, the White House and the FTA, in coordination with APTA, convened a roundtable discussion focused on ensuring adequate U.S. manufacturing capacity to build clean transit buses. The roundtable included approximately 60 representatives from U.S. transit agencies, bus manufacturers, component suppliers, labor unions, federal agencies, and other stakeholders. Many of the participants were interviewed for this Eno/Brookings/CALSTART study.

APTA's president, Paul Skoutelas, noted "The roundtable was built on the work and recommendations of APTA's Bus Manufacturing Task Force." He said, "Changing decades-old procurement regulations and practices is not easy. It requires the leadership of transit agency CEOs, legal and procurement staff, and the transit board members who must approve budgets and contracts. To be successful, education and training for all these stakeholders is essential."

Dan Raudebaugh from the Center for Transportation and the Environment (CTE) presented industry opinions identified through the FTA's Transit Vehicle Innovation Deployment Centers program. The CTE provided a draft report to FTA based upon the stakeholder group's reactions to a list of 20 potential solutions that could ultimately incentivize better manufacturing economies of scale, create healthier supply chains, reduce manufacturers' parts inventories, and lower prices. Around the same time, FTA released its Notice of Funding Opportunity for the "Bus and Bus Facilities" and "Low and No Emission Bus" programs. It gave priority consideration to applications proposing the use of advance or progress payments, joint procurements, or the procurement of base model buses. APTA's Bus Manufacturing Task Force also released its recommendations to bolster competitiveness and stability in the U.S. bus manufacturing sector.

FTA Dear Colleague Letter and New Recommendations

The FTA has worked with the APTA, the Community Transportation Association of America, and other government and industry stakeholders to identify actions to strengthen the industry, lower costs, and accelerate delivery. The FTA has issued recommendations to transit agencies to promote industry health and reduce costs to transit agencies through changes in agencies' procurement practices and reductions in customizations. The FTA has also expanded technical assistance and new priority considerations in the Low or No Emission Grant Program and the Grants for Buses and Bus Facilities Competitive Program.²²

The FTA has recommended best practices and incentives to reduce customizations that prevent the efficiency of scaled production, add unnecessary engineering costs, and prolong procurement cycles. The FTA recommends usage of state schedules, joint

procurements, using base bus models without customization, using the APTA Standard Bus Procurement RFP, and using performance specifications. To lower bus costs and promote competition, the FTA recommends progress payments, minimizing customization, minimizing bonding, using industry pricing indices, performance specifications, and “brand name or equivalent” contract language. According to APTA’s Bus Manufacturing Task Force Recommendations released in 2024, transit agencies can help address manufacturers’ cash-flow shortages by adjusting prices and providing advance payments in current contracts and including inflation/deflation clauses in contracts.

In February 2024, the FTA issued a “Dear Colleague” letter which encourages the use of several tools available to transit agencies to accelerate the delivery of vehicles while reducing costs and risks including: contract clauses specifying a “brand name or equivalent” clause; advance payments to contractors prior to the contractor incurring costs; progress (or milestone) payments to a contractor prior to completion of all contract work; use of state contracts; and performance-based specifications. Some of these recommendations are further explored below:

- The FTA recommends performance-based specifications and the use of “brand name or equivalent” contract language. Requiring a specific brand for a particular component without giving the contractor the option to provide an equivalent could result in a higher vehicle price and supply chain related delays.
- The FTA advocates for agencies procuring base model buses without customizations to reduce the risk, time, and cost of bus procurement, including use of state schedules and joint procurements with minimum customizations or the use of the APTA White Book with minimum customizations. According to the FTA, increased customization means that there is a decreased technical history which may increase warranty costs and maintenance risks.
- For payments, progress payments can be used to reduce manufacturers’ financing costs. The FTA also encourages the usage of bonds or a letter of credit only when necessary and at the minimum amount.²³ FTA also recommends using industry pricing indices. Use of FTA funds for progress payments is permissible if the FTA recipient obtains adequate security for those payments and maintains documentation to show completion of activities. Security is typically a performance bond or letter of credit in the amount of the payments.

APTA Bus Manufacturing Task Force 2.0

In 2023, APTA created its Bus Manufacturing Task Force to address the loss of competition within the transit bus manufacturing industry due to major cash flow challenges. The recommendations from the initial task force influenced the FTA’s 2024

‘Dear Colleague’ letter and changes to the White Book. The first Task Force also recommended that the Bus Procurement Guidelines Working Group create a subgroup, APTA’s Bus Manufacturing Task Force 2.0, to explore whether and how transit agencies could reduce customization and to consider the impacts on suppliers by buses becoming more standardized.

In December 2025, the Task Force published its recommendations, calling for transit agencies to utilize White Book language for commercial terms and conditions in their RFPs, including “price validity/escalation, fleet defects, excusable delays/liquidated damages, changes in law, warranty, performance guarantees, stop work, insurance, terms, and intellectual property/data rights and minimizing deviations to only those required by safety, law, or essential operations.”

The second Task Force also called for reducing vehicle options to promote volume designs and provided specific recommendations for standardization of windows, doors, and floor layouts. The recommendations also called for standardization of inspections and cybersecurity.²⁴

For terms and conditions, APTA identified the top ten pain points increasing cost and risk as: price escalation/price validity; fleet defects; excusable delays/force majeure/liquidated damages; changes in law; warranty requirements; performance guarantees; stop work requirements; insurance; payment terms; and proprietary rights/rights in data/escrow. APTA also identified increasing complexity in terms and conditions, leaving manufacturers with uncapped risk.²⁵

In terms of inspections and acceptance, Bus Manufacturing Task Force 2.0 raised concerns about a lack of consistency between agencies, subjectivity in acceptance, and production delays due to disagreements in the inspection process. The group recommended developing minimum requirements for the education, training, and knowledge of inspectors from both transit agencies and third parties. There should also be updated inspection and quality guidelines in the White Book that agencies should incorporate in their RFPs, and a standard checklist for vehicle acceptance should be created. The group also recommended plant tours during the RFP process and a pilot bus for orders over 20 buses to ensure shared expectations between transit agencies and bus manufacturers.²⁶

In terms of vehicle customization, the working group focused on standardization of windows, doors, and floor layouts/seating. For windows, the group recommended standardizations for the driver’s window glaze, reduction in passenger window options, materials standardization, and standardization of solar-management glass. For doors, the group recommended clarifying default standards and eliminating options that are

less popular. In terms of floor layouts, the group recommended the use of a common layout for 35-foot, 40-foot, 45-foot, and 60-foot buses.²⁷

In January 2026, APTA's Bus Manufacturing Task Force 2.0 produced recommendations to the FTA on changes to the Low or No Emission Grant Program and Buses and Bus Facilities Competitive Program to encourage standardization. For the annual \$1.5 billion delivered through the Low or No Emission Grant Program and Buses and Bus Facilities Competitive Program, APTA recommends that applicants receive additional scoring points in the cost-effective vehicle procurements and strengthen U.S. Vehicle Manufacturing Industry sections based upon alignment with the White Book.

For cost-effective vehicle procurements, in addition to credit for using state schedules, joint procurements, or a standard vehicle model for low- or zero-emission projects, APTA recommends agencies can receive credit by committing "to procuring vehicles using technical specifications prepared exclusively from the APTA Standard Bus Procurement Guidelines." To strengthen U.S. vehicle manufacturing industry, in addition to credit for use of advance payments or contracting terms to expedite payments, agencies should receive credit for committing "to using contracting terms (other than those imposed by state or local law) prepared exclusively from the APTA Standard Bus Procurement Guidelines."

GAO Recommendations

In 2015 Government Accountability Office (GAO) reported that the procurement process can be difficult and resource-intensive for transit agencies, particularly for those transit agencies that do not purchase buses each year and may lack procurement capacity. Smaller agencies tend to have few or no dedicated procurement staff and lack technical, engineering, or specification-writing expertise needed for bus procurement. GAO found that many of the challenges faced by transit agencies could be reduced if they were authorized to purchase buses through the General Services Administration (GSA). Buying through GSA would ensure that buses meet federal procurement requirements, reduce administrative burdens, and potentially lower costs.²⁸

GSA already provides vehicle purchasing services for many federal agencies, using its buying power to secure standardized, federally compliant vehicles at discounted prices. According to the GAO, extending this authority to transit agencies would build on an established, governmentwide system for efficient vehicle procurement. Congress would need to authorize transit agencies to make purchases through GSA. States and local governments have previously been allowed to purchase certain items—such as emergency equipment and homeland security—related products—through GSA. Granting similar authority to transit agencies could reduce the time they spend developing specifications, conducting procurements, and ensuring compliance with

federal requirements, including Buy America. GSA staff also have significant expertise in vehicle procurement and price negotiation.

The GAO also suggested that policy makers consider shifting the responsibility for certification for Buy America to manufacturers. Agencies were required to conduct pre- and post-award reviews of bus manufacturers, an exercise that could be burdensome, complex, and costly to comply with. The GAO identified two other rules that limited the ability of agencies to benefit from other agency's contracts.

- 1) First, federal procurement requirements limited the number of buses an agency may purchase to those needed for its public transportation services. Agencies may not enter into contracts to purchase more buses than they are expected to need. This prevents piggybacking -- assigning contract rights to another transit agency which under FTA rules is only allowed when an agency inadvertently contracts for more buses than it needs. (This rule is still in place).
- 2) In addition, the GAO report noted that transit agencies are not generally aware of other agencies' procurement plans, and there was no entity to formally help facilitate joint purchases. Subsequently, the FAST Act required the FTA to establish a mechanism to allow grantees to work together to purchase rolling stock. The FTA created an online tool, Joint Procurement Clearinghouse,²⁹ for joint procurement participants. Transit procurement staff from throughout the country can use the site to post information about potential opportunities for joint procurement of rolling stock, including buses, railcars and ferries.

The GAO report highlighted another concern that was addressed by the FAST Act. When the GAO report was published in 2015, FTA prohibited agencies from purchasing buses under out-of-state contracts. Under the 2015 Fixing America's Surface Transportation (FAST) Act, an FTA grantee may now purchase rolling stock and related equipment from any state's cooperative procurement contract or schedule.

Appendix 4. Pricing Analysis

Transit agencies across the United States procure zero-emission, hybrid, and conventional buses while navigating technology transitions, regulatory requirements, and operational needs. Although bus prices have increased over the past decade, agencies still lack a centralized resource for comparing costs across propulsion types, geographies, and fleet profiles.

This appendix summarizes findings from the project’s national procurement dataset. The research team compiled and cleaned more than 2,000 procurement records from industry resources, publicly available contracts, state purchasing agreements, agency board materials, incentive program data, and supplemental procurement documentation. Prices were normalized to 2023 dollars using the Consumer Price Index for Urban Consumers (CPI-U) to support comparison across model years and procurement cycles.

The findings are descriptive. They identify observable pricing patterns in the validated data but do not evaluate individual procurement decisions or attribute price differences to specific vehicle specifications, procurement strategies, or contract structures.

i. Methodology

The methodology establishes a consistent approach to organizing, validating, and analyzing procurement pricing data. Where core attributes could not be verified, records were excluded from CPI-adjusted analysis or discussed descriptively.

Available records rarely provide a cohesive thread from an agency’s specifications through the RFP, vendor quotations, the executed contract, and the final invoice. As a result, many entries contain only one or two elements of that chain (e.g., paid price without exercised options, contract price without the agency’s final build). Where core attributes could not be verified across that chain, records were excluded from CPI-adjusted analysis or discussed descriptively.

Data Sources and Coverage

The dataset draws from multiple sources collected through January 2026, including state contract price sheets, agency purchase orders and invoices, supplemental procurement documentation, publicly available procurement records, and direct fleet submissions. Advisory Panel and agency outreach helped inform the intake process, but most usable entries come from publicly available materials and records with sufficient documentation for validation.

Table A-2 summarizes the breadth of data incorporated into the preliminary pricing database through January 2026.

Table A-2. Dataset Coverage Summary (Through January 2026)

Category	Count/Description
Baseline Pricing (State Contracts)	131 price entries
Fleet-Reported Records (Raw)	2,008 entries
Cleansed Fleet Pricing Records	1,628 entries
Propulsion Types Represented	Diesel (690), CNG (398), Hybrid (195), Battery-Electric (240), Hydrogen Fuel Cell (21)
Fleet Size Categories Represented	Small: 98 fleets (<100 buses), Medium: 86 fleets (100–499), Large: 40 fleets (≥500)
Geographic Coverage	Procurements from 42 states and Canada
Time Period Covered	2015 – 2025
Primary Data Sources	State contracts, HVIP voucher records, fleet purchase orders/invoices, manufacturer price sheets, supplemental data

Data Cleaning, Validation, and Standardization

Each procurement record was reviewed for completeness and assigned standardized fields to support consistent comparison across agencies and propulsion types, including propulsion type, vehicle year, fleet-size category, baseline or fleet-reported pricing, and CPI-adjusted cost fields. Records with unresolved inconsistencies, such as OEM/model mismatches, unsupported propulsion assignments, or incomplete price documentation, were retained in the master dataset for transparency but excluded from the cleansed analytical subset.

Analytical Framework

The cleansed dataset was organized around propulsion type, fleet size, vehicle year, and geographic region. Propulsion categories include diesel, CNG, diesel-hybrid, battery-electric bus (BEB), and hydrogen fuel cell electric bus (FCEB). Fleet-size categories are based on fixed-route fleet counts: small fleets have fewer than 100 buses, medium fleets have 100 to 499 buses, and large fleets have 500 or more buses. U.S. procurements were also assigned to Census regions for regional comparison; Canadian procurements are included in the overall dataset but excluded from U.S. regional analysis.

ii. Overview of Available Pricing Data

The pricing dataset includes procurement records collected through January 2026 from sources with varying levels of detail. The research team developed analytical tables and figures to compare baseline and fleet-reported pricing, CPI-adjusted trendlines by propulsion type, quartile price dispersion, and regional median prices. All prices referenced in the analytical sections are normalized to 2023 dollars unless otherwise noted.

iii. Data Coverage and Scope of Analysis

The cost-trend analysis draws on records with verified propulsion type, defined vehicle year, and sufficient pricing information to support CPI adjustment. Records that could not be validated across these core attributes were excluded from the analytical subset. Table A-3 summarizes the records that meet these inclusion criteria and form the analytical basis for the CPI-adjusted pricing results presented below.

Table A-3. Records Included in CPI-Adjusted Analysis

Category	Count/Description
Total Records in Cleansed Dataset (2015 – 2025)	1,628
Records Used in CPI-Adjusted Analysis	1,544
Propulsion Types Represented in Analysis	Diesel (690), CNG (398), Hybrid (195), Battery-Electric (240), Hydrogen Fuel Cell (21)
Fleet Size Categories Represented	Small (98), Medium (86), Large (40)
Baseline Pricing Records Available for Comparison	131

Records excluded from the CPI-adjusted analysis typically lacked sufficient documentation to confirm one or more core attributes, such as propulsion type, price year, or vehicle configuration. The resulting analytical subset provides a consistent foundation for examining pricing patterns across propulsion type, fleet size, region, and procurement year.

iv. CPI Normalization and Methodology

To compare procurement prices across different vehicle years, all records included in the analysis were normalized to 2023 dollars using CPI-U. Each nominal price was adjusted using the ratio of the 2023 CPI to the CPI for the vehicle year.

$$\text{Adjusted Price} = \text{Nominal Price} \times (\text{CPI}_{2023} / \text{CPI}_{\text{vehicleyear}})$$

This normalization helps distinguish observed pricing patterns from changes in purchasing power over time. It does not control for vehicle specifications, contract structure, order size, or agency-specific options.

v. Preliminary Pricing Patterns

The CPI-adjusted dataset reveals several pricing patterns across propulsion types, fleet sizes, regions, and baseline versus fleet-reported values. These findings reflect only what the validated data can support and should be interpreted as descriptive rather than causal.

Pricing Patterns by Propulsion Type

The CPI-adjusted procurement dataset shows distinct pricing trajectories across propulsion types between 2015 and 2025. Diesel, CNG, and diesel-hybrid buses show real price growth over the period: diesel increased by 12.9 percent, CNG by 14.2 percent, and diesel-hybrid by 13.9 percent.

BEBs, while still more expensive than combustion platforms, did not experience comparable real growth. CPI-adjusted average BEB pricing declined slightly over the same period (-1.4 percent).

Due to the limited number of validated FCEB procurements in the dataset, FCEBs are excluded from the directional trend analysis and related figures.

Figure A-4. CPI-Adjusted Price Trends by Propulsion Type (2015–2025)
Inflation-normalized average pricing for diesel, CNG, hybrid, and BEB transit buses.

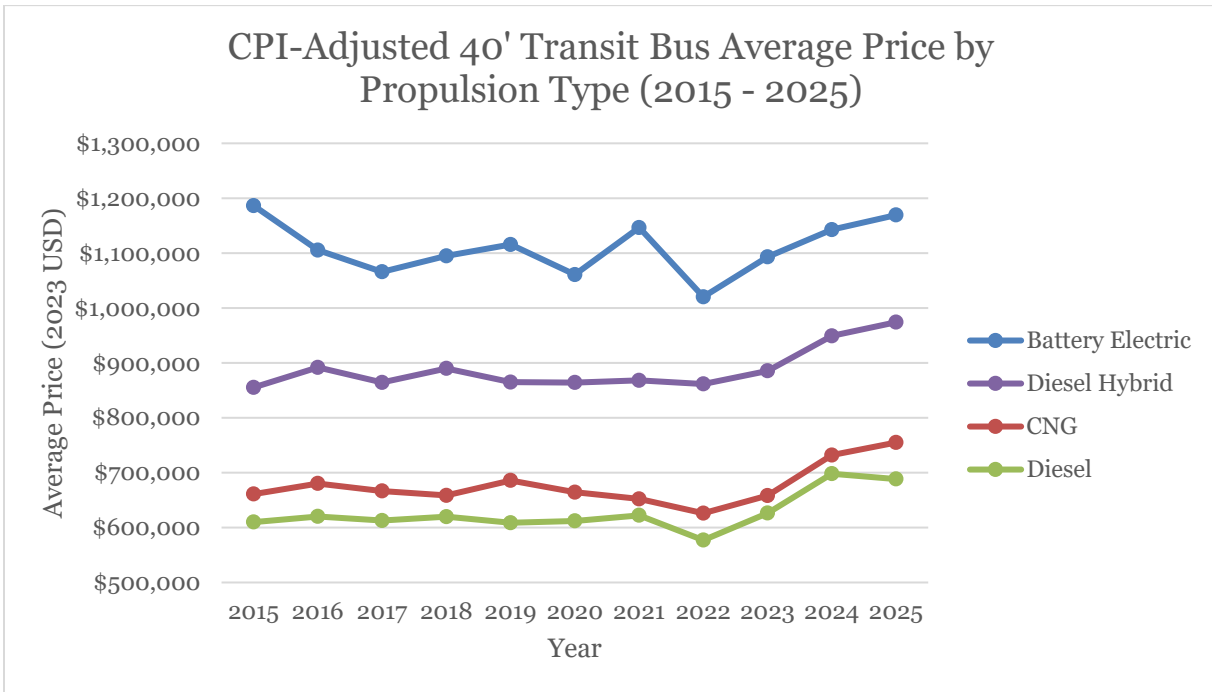
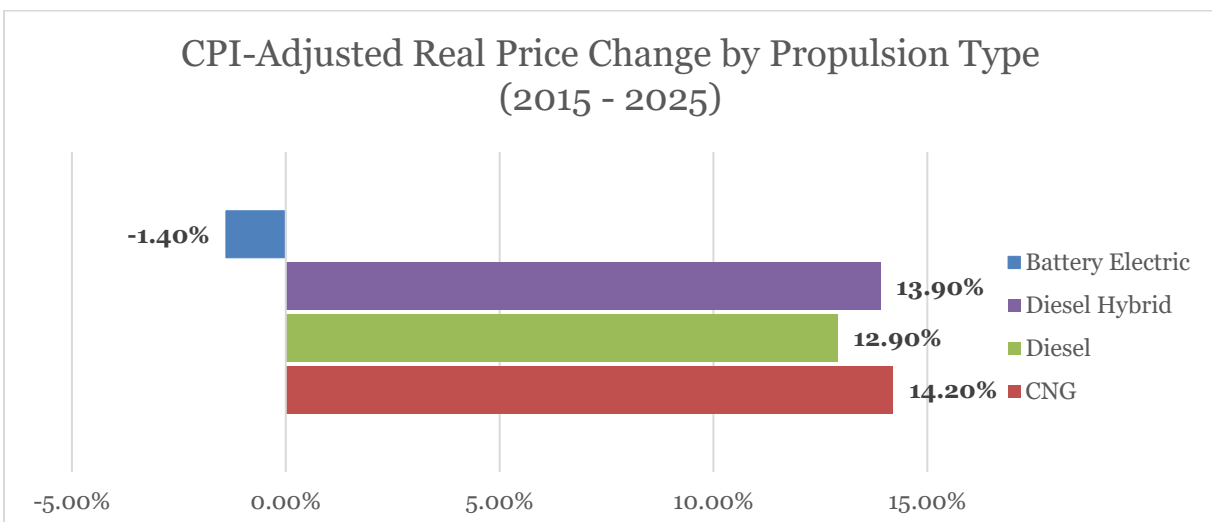


Figure A-5. Inflation-Adjusted Price Change by Propulsion Type (2015-2025)
Percentage change in CPI-adjusted average pricing between 2015 and 2025. Combustion-based platforms show real price growth of approximately 13-14 percent, while BEB pricing remained relatively stable in inflation-adjusted terms.



These findings describe observable pricing outcomes within the validated dataset. The analysis does not isolate underlying cost drivers such as vehicle configuration, battery capacity, order size, procurement structure, or supply-chain conditions.

Price dispersion was also evaluated using quartiles. This approach shows how prices are distributed within each propulsion category and helps identify the spread between lower-cost and higher-cost records.

BEBs exhibit higher median values than combustion technologies and greater dispersion between quartiles, reflecting variation in battery capacity, configuration, charging interfaces, and agency-specific selections. FCEBs show the highest median values in the dataset, but the small number of validated records limits interpretation. These quartile-based findings complement the directional analysis shown in Figures A-4 and A-5. As with the trend analysis, they describe pricing dispersion rather than identifying specific cost drivers.

Table A-4 presents the CPI-adjusted quartile values for each propulsion category included in the analysis.

Table A-4. CPI-Adjusted Price Quartiles by Propulsion Type (2015 – 2025)
Median (Q2) and quartile values (Q1, Q3) for cleansed procurement records, normalized to 2023 USD. The interquartile range (IQR) reflects the dispersion within each propulsion category.

Propulsion Type	Count	First Quartile Price	Median Price	Third Quartile Price
Diesel	326	\$464,156	\$501,067	\$573,830
CNG	207	\$513,396	\$553,189	\$596,635
Diesel-Hybrid	104	\$670,514	\$727,293	\$792,505
Battery-Electric	168	\$901,966	\$994,802	\$1,124,607
Hydrogen	21	\$1,212,161	\$1,297,838	\$1,538,273

Pricing Patterns by Fleet Size Category

The cleansed dataset supports an initial comparison of CPI-adjusted prices across small, medium, and large fleet categories. At this stage, the data does not show a clear or consistent relationship between fleet size and bus price. Median prices across fleet-size categories overlap substantially, and observed variation appears more closely tied to propulsion type, documentation completeness, and configuration differences than fleet-size category alone. These results indicate that fleet size alone is insufficient to explain the observed differences in CPI-adjusted bus prices.

Regional context was also reviewed because operating environments, regulatory requirements, and procurement practices can vary by geography.

Pricing Patterns by Region

To evaluate potential geographic variation independent of propulsion mix, median CPI-adjusted prices were calculated by Census region within each propulsion category.

Table A-5. CPI-Adjusted Median Price by Census Region

Region	Battery Electric	CNG	Diesel	Diesel Hybrid
Midwest	\$1,087,051	\$616,226	\$564,046	\$824,152
Northeast	\$1,110,385	\$643,012	\$632,569	\$863,996
South	\$1,038,855	\$649,733	\$577,008	\$851,932
West	\$1,069,183	\$681,028	\$607,387	\$955,573

Note: Regional medians are based on validated U.S. procurements in the current dataset (Midwest: n=234; Northeast: n=226; South: n=508; West: n=528). FCEBs are excluded from this regional comparison due to limited records outside the Western region.

Across BEB, CNG, diesel, and diesel-hybrid buses, regional median prices are broadly comparable within each propulsion category. The dataset does not show large or consistent regional price differentials once propulsion type is held constant. More detailed geographic analysis would require consistent documentation of configuration choices, funding structures, and procurement terms across agencies.

Baseline vs. Fleet-Reported Pricing

Comparing baseline state-contract pricing with fleet-reported procurement costs provides an early view of how documented vehicle selections, options, and purchase scope can affect final pricing.

Figure A-6 summarizes the CPI-adjusted baseline and fleet-reported average prices for records where both are available. Fleet-reported prices exceeded baseline prices by approximately \$136,000 for BEBs, \$38,000 for CNG buses, \$63,000 for diesel-hybrid buses, and \$76,000 for diesel buses.

The current dataset lacks consistent documentation of selected equipment, propulsion configurations, onboard technology, accessibility features, and other agency-specific elements. As a result, these differences should be interpreted as observed pricing gaps rather than confirmed customization premiums.

Including both baseline and fleet-reported pricing provides context for understanding how standardized contract prices compare with documented procurement outcomes.

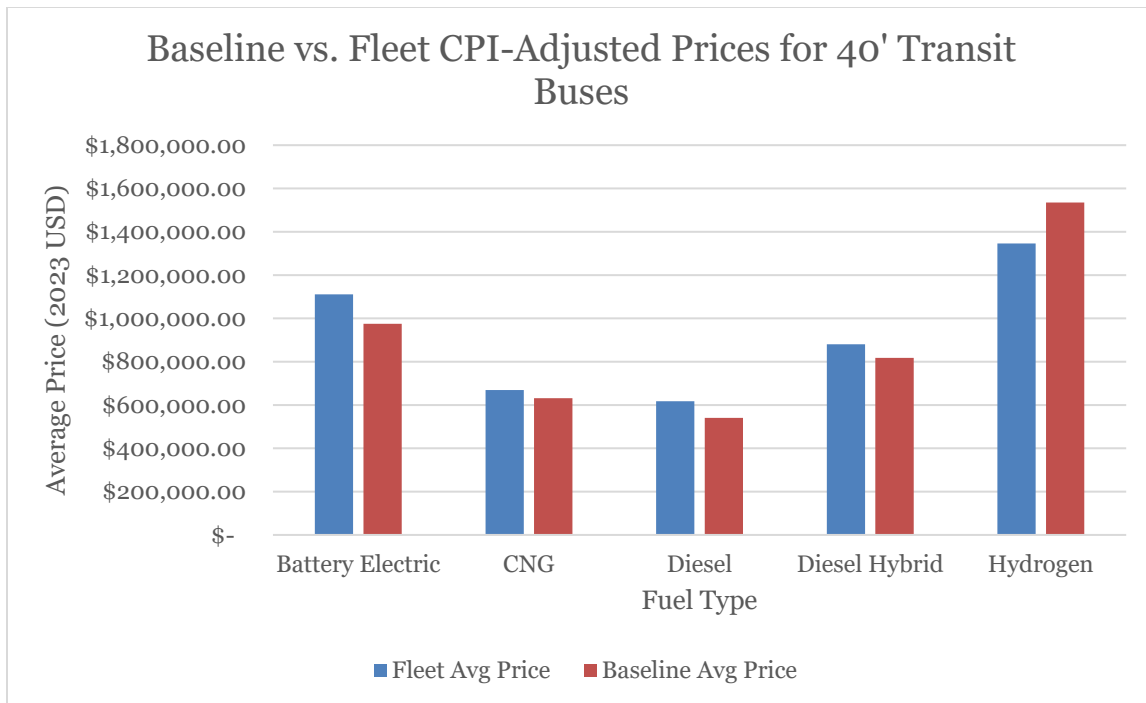


Figure A-6. Baseline vs Fleet-Reported CPI-Adjusted Pricing
Comparison of CPI-normalized baseline (state contract) and fleet-reported procurement prices. Differences reflect documented procurement outcomes and variation in available pricing details, not specification-driven factors.

Differences between baseline contract prices and fleet-reported procurement prices reflect variation in purchase scope, selected options, taxes, delivery, contingency treatment, and available documentation. The dataset cannot isolate the precise contribution of each factor.

Available component and option pricing helps illustrate how agency-specific selections can influence total vehicle cost.

Component Cost Patterns and Their Contribution to Pricing Variation

Transit bus procurement operates within a highly configurable specification environment shaped by agency requirements, OEM offerings, and cooperative contract structures.

Representative 2025 state-contract price sheets from two major OEMs each include more than 500 discrete line items for 40-foot buses. Many items are already included in base pricing, while others are listed as optional selections, substitutes, deductions, or configuration-specific additions.

This level of configuration breadth is reflected in published option catalogs, where individual subsystem selections can add measurable cost. Examples include HVAC upgrades, fare collection systems, seating configurations, automatic passenger counters, and enhanced driver protection.

Seating configurations range from approximately \$15,000 to \$19,000 per bus, while enhanced driver protection enclosures exceed \$13,000. Fare collection systems can add approximately \$18,000 to \$20,000, automatic passenger counters approximately \$7,800 to \$8,200, and HVAC upgrades approximately \$20,000. Some aesthetic packages, such as trolley styling, exceed \$115,000 per bus.

Even without propulsion-specific equipment, selected options can add \$50,000 to \$90,000 per bus, depending on the configuration. These values are illustrative and should not be interpreted as the sole explanation for differences between baseline and fleet-reported prices.

vi. Data Gaps and Opportunities for Future Research

The database provides a structured foundation for comparing transit bus procurement pricing, but several data gaps limit deeper causal analysis. Funding-source documentation is inconsistent across records, limiting the ability to distinguish federal-, state-, and locally funded procurements or to evaluate how funding structures affect pricing. Component- and option-level pricing is available in some state contracts and select fleet procurements. Still, it is not consistently documented, which limits the ability to isolate how specific selections affect final vehicle prices.

The database also does not consistently document elements of the procurement structure, such as cooperative purchasing, direct solicitation, order quantities, negotiated options, or contract amendments. FCEB procurements remain limited compared with other propulsion types, and the smaller number of validated records limits the ability to analyze FCEB pricing trends with the same confidence as diesel, CNG, hybrid, and BEB records.

Baseline state-contract pricing provides standardized reference points, while fleet-reported prices reflect selected configurations and final procurement scope. Consistent documentation of final build sheets, exercised options, price adjustments, and procurement-reporting practices would strengthen future comparisons across technologies, regions, fleet sizes, and procurement structures. Continued expansion of standardized procurement-reporting practices would improve the ability to evaluate pricing variation across technologies, regions, fleet sizes, and procurement structures.

vii. Pricing Analysis Conclusions

This appendix presents a descriptive analysis of transit bus procurement pricing based on records collected and validated through January 2026. The analysis draws from more than 2,000 procurement records, including state contract pricing, fleet-reported purchase records, manufacturer price sheets, and supplemental procurement documentation. Prices were normalized to 2023 dollars using the CPI-U to facilitate comparisons across procurement years.

Across the available data, pricing patterns vary most clearly by propulsion type. Conventional propulsion technologies show lower median prices and narrower dispersion, while BEBs and FCEBs show higher median prices and wider ranges. The analysis does not show a consistent relationship between fleet size and CPI-adjusted bus prices, nor does it show large or consistent regional price differences once propulsion type is held constant.

Comparing baseline state-contract prices with fleet-reported procurement prices shows that baseline values often understate documented procurement costs. Examples of available components and options indicate that agency-specific selections can materially affect final vehicle prices. Still, the dataset does not provide enough consistent configuration detail to attribute price differences to specific options, specifications, procurement strategies, or funding sources.

The procurement database and associated analysis provide a transparent foundation for understanding bus pricing patterns, but the findings should be interpreted as descriptive rather than causal. Future updates would benefit from more consistent documentation of final vehicle configuration, exercised options, price adjustments, funding sources, and procurement structure.

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