Final Regulatory Assessment

Final Revised Accessibility Guidelines for Buses, Over-the-Road Buses, and Vans (36 CFR Part 1192, Subpart B)

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1. EXECUTIVE SUMMARY

This final regulatory assessment (Final RA) estimates the incremental costs of, and qualitatively describes the benefits from the U.S. Access Board (Access Board)'s final rule, which revises and updates accessibility guidelines for buses, over-the-road buses (OTRBs), and vans. (In the final rule, buses, over-the-road buses, and vans are collectively referred to as "non-rail vehicles.") The Americans with Disabilities Act (ADA) requires the Access Board to issue guidelines for transportation vehicles—including buses, over-the-road buses, and vans—to ensure that new and remanufactured vehicles are readily accessible to and usable by individuals with disabilities. *See* 42 U.S.C. § 12204. These guidelines serve as the basis for enforceable accessibility standards issued by the United States Department of Transportation (DOT). *Id*. § 12149.

In 2010, the Access Board issued a notice of proposed rulemaking (NPRM) for proposed revisions to its existing transportation vehicle guidelines applicable to buses, vans, and OTRBs, which had been originally issued in 1991. Most of the revisions reflected in the proposed rule were stylistic or editorial only, and were not expected to have a cost impact. One requirement, however, was expected to have a cost impact—the requirement that transit agencies over a specified size threshold provide automated stop and route announcement systems on their large vehicles operating in fixed-route service. To accompany the NPRM, the Access Board thus prepared a preliminary regulatory assessment (Preliminary RA) that evaluated the estimated costs of the automated announcement systems requirement.

After the close of the NPRM comment period, the Access Board reviewed and considered comments received in response to both the NPRM and the Preliminary RA. Based on this review, revisions have been incorporated into the final rule. A detailed discussion of the final rule and the Access Board's responses to comments relating to the substance of the proposed regulations can be found in the preamble to the final rule. This Final RA incorporates changes to estimates, assumptions, and certain aspects of the cost methodology. These changes were made, among other things, to address comments on the Preliminary RA, incorporate changes in the final rule, or refine modelling assumptions based on updated research or data sources.

The Final RA largely follows the cost methodology used in the Preliminary RA, with some adjustments. In sum, the Final RA estimates the incremental costs of the automated announcement systems requirement, as well as four accessibility requirements (or sets of requirements) that are newly applicable to OTRBs—namely, identification of accessible seating and doorways, exterior destination/route signage, public address systems, and stop request systems. Costs related to these latter four requirements were not assessed in the Preliminary RA, which only evaluated costs related to the proposed requirements for automated announcement systems. Other revisions and updates reflected in the Final RA's cost methodology include: use of three (rather than two) cost scenarios—low, primary, and high—when estimating incremental costs of the final rule; incorporation of the four new OTRB-specific accessibility requirements into the cost model; evaluation of the cost impact of the automated announcement systems requirement using three size-based "tiers" (Tier I, II and III) for large transit agencies; and, addition of a small business analysis. The Final RA also includes a qualitative discussion of the expected benefits of the final rule, given that, for a variety of reasons, benefits accruing from the final rule cannot be reliably monetized.

In terms of results, the Final RA shows that, over the studied 12-year regulatory timeframe, annualized incremental costs from the revised accessibility guidelines for non-rail vehicles are expected to range from $2.3 million to $8.0 million, depending on the cost scenario and discount rate. Presented below is the annualized incremental cost of the revised guidelines under each of the three respective cost scenarios using 3% and 7% discount rates:

Discount Rate	Low Scenario ($millions)	Primary Scenario ($millions)	High Scenario ($millions)
3%	$2.6	$5.0	$8.0
7%	$2.3	$4.5	$7.2

The Final RA also assesses the economic impact of the final rule from several other cost perspectives, including: annualized costs of the automated announcement systems requirement, as well as the four new OTRB accessibility requirements. First, with respect to automated announcement systems, annualized costs range from about $44,000 (for a Tier I agency under the low scenario) to about $430,000 (for a Tier III agency under the high scenario). Under the primary scenario, which models what are considered to be the most likely set of cost assumptions, per-agency costs for announcement systems are estimated to be as follows: Tier I - $80,659; Tier II - $154,985; and, Tier III: $264,968. Second, in terms of the new OTRB-specific accessibility requirements, the Final RA shows that the cost impact of these requirements are expected to be relatively modest, with annualized costs per vehicle expected to range from $549 (low scenario) to $1,513 (high scenario) at a 7% discount rate. In light of this modest cost profile, the Final RA's small business analysis finds that, while the final rule will undoubtedly affect a substantial number of "small business"-sized OTRB firms (in light of small firms' predominance in the relevant transportation, charter, and sightseeing industry sectors), its economic impact is expected to be neither significant nor disproportionate relative to other firms.

Lastly, the Final RA describes the benefits of the final rule from a qualitative perspective, and, to the extent possible, discusses a general framework for understanding the potential pool of persons with disabilities who may directly benefit from one or more of the revised accessibility guidelines. The revised accessibility guidelines in the final rule will directly benefit a significant number of Americans with disabilities by ensuring that public transit buses and OTRBs are accessible and usable. By addressing communication barriers (and, to a lesser extent, access barriers) encountered on such vehicles by persons with vision, hearing, mobility, and cognitive impairments, the final rule will better enable persons with such disabilities to use these modes of transportation to work, pursue an education, access health care, worship, shop, or participate in recreational activities. Other individuals or entities, such as transit agencies, will also likely experience benefits through, for example, improved customer satisfaction attributable to automated announcement systems.

2. INTRODUCTION

The Access Board has prepared this final regulatory assessment (Final RA) to evaluate the likely costs and benefits of the agency's final revised accessibility guidelines for buses, over-the-road buses, and vans (final rule). These final rules are the final step in the rulemaking process for revised guidelines for these three types of vehicles.

In July 2010, the Access Board formally began the process of updating its existing vehicle guidelines for buses, over-the-road buses, and vans by issuing a notice of proposed rulemaking.[1] As noted in the NPRM, most of the revisions in the proposed rule were stylistic or editorial only, and were not expected to have an incremental cost impact.[2] The Access Board did, however, propose a substantive change to the existing vehicle guidelines concerning stop and route announcements. In sum, the NPRM proposed that transit agencies operating 100 or more buses in annual maximum service in fixed route systems (as reported in the National Transportation Database) be required to provide automated stop and route announcements on newly purchased, leased, or remanufactured large buses (*i.e.*, buses over 25 feet in length) used in fixed route service with multiple designated stops.[3] The Access Board, with the assistance of the Volpe National Transportation Systems Center (Volpe Center) through an inter-agency agreement, prepared a report with a preliminary assessment of the costs for the proposed new requirements for automated stop and route announcements, which was posted in the online regulatory docket (www.regulations.gov) and on the agency's website (www.access-board.gov).[4] (Preliminary RA). The public was given several months to submit comments on the proposed rule or Preliminary RA. The Access Board also conducted several public hearings on the proposed rule.[5]

The Access Board reviewed and considered the comments received in response to both the NPRM and the Preliminary RA. Based on this review, revisions have been incorporated into the final rule. A

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[1] Notice of Proposed Rulemaking, 75 Fed. Reg. 43,748 (July 26, 2010) [hereinafter, "NPRM"]; *see also* 36 C.F.R. pt. 1192, subpts. B & G (existing regulations for buses, vans, and over-the-road buses). Prior to the publication of the NPRM, the Access Board also posted on its website—and accepted comments on—draft revisions to the existing requirements for buses, vans, and OTRBs. *See* Availability of Draft Revisions to Guidelines, 72 Fed. Reg. 18,179 (Apr. 11, 2007); Availability of Draft Revisions to Guidelines, 73 Fed. Reg. 69,652 (Nov. 19, 2008).

[2] *See* id. at 43,749.

[3] Id. at 43,753-54 (discussing proposed T203.13 and T704). The final rule increased the minimum length threshold for "large vehicles" from 22 feet to 25 feet based on comments to the NPRM observing that the exterior length of vans and small buses had increased in recent years to accommodate safety bumpers and frontal crash protection features, without a concomitant increase in interior passenger space or square footage. *See* Preamble to Final Rule – Americans with Disabilities Act Transportation Vehicle Guidelines, Section IV (Summary of Significant Comments on Other Aspects of the Proposed Rule) – T103 Definitions (discussing definitions of "large vehicle" and "small vehicle"). This slight modification to the definition of "large vehicle" in the final rule is not expected to have any material cost impact.

[4] Access Board, *Cost Estimates for Automated Stop and Route Announcements* (July 2010), available at: http://www.regulations.gov/#!documentDetail;D=ATBCB-2010-0004-0003 (last accessed Jan. 4, 2016).

[5] Subsequently, in 2012, the comment period was reopened for several months to solicit additional public input on regulatory requirements for bus ramps. *See* Notice of Public Information Meeting and Reopening of Comment Period, 77 Fed. Reg. 50,068 (Aug. 20, 2012).

detailed discussion of the final rule and the Access Board's responses to comments relating to the substance of the proposed regulations can be found in the preamble to the final rule. This Final RA, as well, incorporates changes to estimates, assumptions, and certain aspects of the cost methodology. These changes were made, among other things, to address comments on the Preliminary RA, incorporate changes in the final rule, or refine modelling assumptions based on updated research or data sources.

The Final RA estimates the impact of the final rule in terms of incremental costs and benefits for covered entities and persons with disabilities. Costs to affected transit agencies and OTRB firms from complying with the final rule are monetized on an incremental basis, meaning the impact of the final rule relative to a primary baseline of existing regulations or industry practice. Benefits from the final rule to persons with disabilities (and others) are, due to methodological difficulties in monetization, described in qualitative terms. In keeping with the Regulatory Flexibility Act (5 U.S.C. § 601), this final regulatory assessment also provides a final regulatory impact analysis, which evaluates whether the revised accessibility guidelines for non-rail vehicles set forth in the final rule are expected to have a substantial economic impact on a significant number of small entities. Lastly, appendices to this Final RA present additional information about the underlying cost methodology—most particularly its data and assumptions—as well as likely annual (or annualized) costs to regulated entities under various cost scenarios.

3. BACKGROUND

3.1. Existing Regulatory Requirements for Buses, Vans, and OTRBs

The Americans with Disabilities Act (ADA) requires the Access Board to issue guidelines for transportation vehicles—including buses, over-the-road buses, and vans—to ensure that new and remanufactured vehicles are readily accessible to and usable by individuals with disabilities. *See* 42 U.S.C. § 12204. These guidelines serve as the basis for enforceable accessibility standards issued by the United States Department of Transportation (DOT) that apply to the acquisition of new, used, and remanufactured transportation vehicles, and the remanufacture of existing transportation vehicles covered by the ADA. *Id*. § 12149.

The Access Board issued transportation vehicle accessibility guidelines in September 1991. *See* 56 Fed. Reg. 45,530 (Sept. 6, 1991) (codified at 36 C.F.R. pt. 1192) [hereinafter, "1991 Vehicle Guidelines"]. As a general matter, the 1991 Vehicle Guidelines provide accessibility requirements for boarding and alighting, onboard circulation, wheelchair spaces and securement devices, priority seating, signage, stop request systems, and public address systems. Of particular relevance to this regulatory assessment, the Guidelines require large buses (*i.e*., more than 22 feet in length) that operate in fixed route systems and make multiple stops to provide a public address system that permits the driver (or recorded or digitized speech message) to announce stops and to provide other passenger information. *See* 36 C.F.R. §§ 1192.35, 1192.61.

The same day, DOT adopted the 1991 Vehicle Guidelines as enforceable accessibility standards. *See* 56 Fed. Reg. 45,584 (Sept. 6, 1991) (codified at 49 C.F.R. pts. 37 & 38). With respect to stop announcements, the DOT regulations—as with the 1991 Vehicle Guidelines—require large buses that operate in fixed route systems to announce stops and provide other passenger information via public address systems. 49 C.F.R. § 38.35; *see also id*. §§ 37.167(b) & (c). However, the DOT regulations also provide additional specifications for stop and route announcements on fixed route systems, specifying that covered entities, at a minimum, audibly announce: stop requests by passengers with disabilities; transfer points, major intersections, and destinations; and, "intervals along a route sufficient to permit individuals with visual impairments or other disabilities to be oriented to their location." 49 C.F.R. § 37.167(b). These requirements apply to both public transit agencies and private transit operators engaged in fixed route service.

In 1998, the Access Board and DOT issued a joint final rule amending their respective vehicle guidelines and standards to provide accessibility requirements for over-the-road buses. *See* 63 Fed. Reg. 51,694 (Sept. 28 1998) (codified at 36 C.F.R. pt. 1192, subpt. G & 49 C.F.R. pt. 38, subpt. H) [hereinafter, "1998 Vehicle Guidelines"]. As with the existing regulations for buses and vans, the final rule for over-the-road buses specified accessibility requirements for boarding and alighting, onboard circulation, and wheelchair spaces and securement devices. Unlike those existing regulations, however, the final rule for OTRBs did not require public address systems, stop request systems, or destination and route signs.

3.2. Announcements on Fixed Route Buses – History of Compliance Issues

Since 1991, while stop and route identification announcements on buses in fixed route service have greatly benefited riders with disabilities, effective implementation of these requirements have proven to be a challenge for many transit entities. Under existing regulations, buses operating in fixed route service can use either vehicle operators or automated messages to provide requisite stop and route information. Transit agencies that use vehicle operators to announce stops and routes must train vehicle operators and systematically monitor their performance to ensure compliance.[6] Consequently, transit agency announcement programs that primarily rely on operator-based announcements have proven to be both labor intensive and have a greater likelihood of experiencing system-wide compliance problems.[7] Operators often fail to make announcements, or, when announcements are made, there are frequently problems with the clarity, audibility, or timeliness of such announcements. Indeed, compliance reviews conducted by the Department of Transportation show that vehicle operator compliance with the existing regulatory requirements for announcements is rarely above 50 percent.[8] Failure to provide required ADA stop and route announcements have also spawned numerous ADA lawsuits.[9] In sum, despite the promulgation of mandatory standards for announcements on fixed route buses more than two decades ago, significant problems still persist. Riders with disabilities and transportation researchers continue to identify inadequate stop and route announcements as significant impediments to the use of public bus transportation by persons with disabilities.[10]

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[6] *See, e.g.*, Transportation Research Board, TCRP Report 163, *Strategy Guide to Enable and Promote Use of Fixed-Route Transit by People with Disabilities* 35-36 (2013) (noting importance of high-level management support for effective onboard stop and route announcement programs, including comprehensive driver training, proactive monitoring, and discipline/incentives programs).

[7] Based on ADA compliance reviews by DOT's Federal Transit Administration, operator-based stop and route announcements are a frequent source of rider complaints. DOT/FTA compliance review reports are available at: http://www.fta.dot.gov/civilrights/12875_3899.html.

[8] *See id*. For example, in a compliance review of the Springfield Mass Transit District, the FTA observers found that stops were announced by vehicle operators and audible on only 38% of route segments, and, on 32% of route segments, there were no stop announcements made by vehicle operators. *See ADA Fixed Service Review - Springfield Mass Transit District, Review of Stop Announcement and Route Identification Efforts* 13-14 (July 6, 2012), available at: http://www.fta.dot.gov/documents/SMTD_Final_Report.pdf (last visited: Jan. 19, 2016).

[9] *See, e.g.*, *Tandy v. City of Wichita*, 380 F. 3d 1277 (10 Cir. 2004); *Stewart v. New York Transit Auth*., 2006 U.S. District LEXIS 4279 (Feb. 6, 2006); *Martin v. Metropolitan Atlanta Rapid Transit Authority*, 225 F. Supp. 2d 1362 (N.D. Ga. 2002); *Neff v. VIA Metropolitan Transit Authority*, 178 F.R.D. 185 (W.D. Tex. 1998); *see also Daniels-Finegold v. Massachusetts Bay Transportation Authority*, C.A. No. 02 CV 11504 MEL (U.S. Dist. Ct. Mass. filed June 15, 2006) (approving class action settlement and entering final judgement in ADA litigation alleging system-wide problems in provision of accessible public transportation by defendant transit agency, including failure to announce stops and routes).

[10] *See, e.g.*, National Council on Disability, *Transportation Update: Where We've Gone and What We've Learned* 38-39 (May 4, 2015), available at: http://www.ncd.gov/publications/2015/05042015; National Council on Disability, *Current State of Transportation for People with Disabilities in the United States* (June 13, 2005), available at: http://www.ncd.gov/policy/current-state-transportation-people-disabilities-united-states.

3.3. Growing Use of Intelligent Transportation Systems by Transit Agencies

Since the early 2000s, deployment of various advanced technologies in transportation—commonly referred to as "Intelligent Transportation Systems" (ITS)—has grown substantially. ITS generally refers to "the application of advanced information and communications technology to surface transportation in order to achieve enhanced safety and mobility while reducing the environmental impact of transportation."[11] For public transit systems, ITS deployments generally include a "core" set of applications for Automatic Vehicle Location (AVL)/Computer-Aided Dispatch (CAD) that facilitate management of fleet operations by providing real-time information on vehicle location. In most modern AVL systems, system components include, at a minimum: central software and IT equipment used by dispatchers for management of operations; communications hardware; onboard computer (typically, with mobile data communications capabilities); and onboard Global Positioning System (GPS) receiver and antenna.[12] ITS deployments, moreover, vary in their respective levels of complexity and options. According to DOT annual statistics tracking ITS deployments nationally, as of 2013, nearly 90% of fixed route buses were equipped with AVL, which represented a 177.4% increase in AVL deployments since 2000.[13]

ITS/AVL deployments for public transit also now commonly include a range of additional functionalities—either as components integral to system-wide AVL procurement or later as modular or incremental AVL system upgrades—such as electronic fare payment, automatic passenger counters, real-time "customer facing" traveler information, vehicle maintenance monitoring, and incident management.[14] Specifically, of particular relevance to this assessment, automated announcement systems and variable (or dynamic) message signs are two ITS/AVL applications increasingly being used by transit agencies for ADA onboard stop announcements and external route identification. According to the annual *Public Transportation Vehicle*

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[11] DOT, FHWA-JPO-11-052, *Intelligent Transportation Systems (ITS) Standards Program Strategic Plan for 2011–2014* 4, 7 (April 2011). DOT's ITS Joint Program Office, on its FAQ web page, describes ITS as follows: "ITS improves transportation safety and mobility . . . through the integration of advanced communications technologies into the transportation infrastructure and in vehicles. [ITS] encompass a broad range of wireless and wire line communications-based information and electronics technologies." DOT/ITS Joint Program Office, About ITS – Frequently Asked Questions, http://www.its.dot.gov/faqs.htm (last visited January 4, 2016).

[12] For good descriptions of typical AVL/CAD system architecture and features when deployed by bus transit systems, see *DOT/FTA, Transportation Research Board, TCRP Synthesis 73 AVL Systems for Bus Transit: Update* 1-8 (2008); *Advanced Public Transportation Systems: The State of the Art Update 2006*, Chaps. 2, 3 & 5 (March 2006). While AVL systems now predominately rely on GPS-based methods of determining vehicle position, some systems still use signals from signposts or dead-reckoning (*i.e.*, calculation from a known position, odometers, compass readings), either alone or as a complement to a GPS-based system. *TCRP Synthesis 73* at 6-7, 92-93; David P. Racca, *Costs and Benefits of Advanced Public Transportation Systems at Dart First State* 2-3 (July 2004).

[13] DOT, *Deployment of Intelligent Transportation Systems: A Summary of the 2013 National Survey Results* xiv, 26-27 (Aug. 2014). The data also show that the proportion of transit agencies deploying AVL on fixed route buses continued to increase in 2013, and at an accelerated rate between 2010 and 2013. Id. at 27.

[14] *See, e.g.*, *id.*; DOT/FTA, *APTS State of the Art Update 2006*, *supra* note 12, at chaps. 3 & 4.

Database maintained by the American Public Transport Association (APTA), the number of fixed route buses that provide automated announcements has increased from 10% in 2001 to 69% in 2015.[15]

Automated announcement systems help ensure that required ADA stop and route announcements are made, and made consistently and clearly. Automated announcement systems also lessen the need to rely on vehicle operators for compliance, and, thereby, allow operators to pay more focused attention on driving or other operational tasks. To be sure, automated announcement systems—as with any IT system are not infallible. System components may break down, announcements volume may need adjustment, or mistimed announcements may necessitate revisions to geocoded stop data.[16] Moreover, automated announcement systems need to be installed and maintained properly to be effective, and agency personnel must be trained on use of such equipment (and what to do should the system malfunction).[17] Nevertheless, both transportation studies and FTA compliance investigations over the past ten years strongly evidence that, on balance, automated stop and route announcement systems demonstrably outperform operator-based announcement programs in terms of both ADA compliance and benefits to persons with disabilities.[18]

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[15] Historical data on ASA deployment is based on the Appendix to APTA's *2015 Public Transportation Fact Book,* which provides data on vehicle amenities by mode of travel from 2001 through 2014. *See 2015 Public Transportation Fact Book, Appendix A: Historical Tables*, Table 30 (June 2015), available at: https://www.apta.com/resources/statistics/Documents/FactBook/2015-APTA-Fact-Book-Appendix-A.pdf. Data on ASA deployments in 2015 is derived from a sample of vehicle amenity data in the 2015 *APTA Public Transportation Database*, which is available for purchase from APTA.

[16] *See, e.g.*, National Council on Disability, *Transportation Update: Where We've Gone and What We've Learned* 42-43 (May 2015); National Council on Disability, *The Current State of Transportation for People with Disabilities in the United States* 26-30 (June 2005).

[17] For a discussion of suggested maintenance and training best practices for successful implementation of automated (or manual) stop and route announcement programs, see Easter Seals Project ACTION, *Accessible Community Transportation in Our Nation: Resource Guide to Effective Approaches for Increasing Stop Announcements and Route Identification by Transit Operators* 40-49, 65-68 (June 2009).

[18] *See* NCD, *Transportation Update 2015*, *supra* n. 10, at 21, 38-39; *see also* DOT/FTA, ADA Compliance Review Final Reports – Fixed Route Operations (2000 - 2015), available at: http://www.fta.dot.gov/civilrights/12875_3899.html (last visited Jan. 19, 2016). For example, when reviewing the King County Metro Transit, FTA observers found that its automated announcement system properly announced about 90% of programmed stops (though observers also took issue with KCMT's selection of programmed stops). *See* FTA, *King County Metro Transit – FTA ADA Stop Announcement and Route Identification Review Report* 14-15 (Aug. 2015). Perhaps the best window into the value of automated announcement systems is provided by FTA compliance reviews conducted when transit agencies are in the midst of transitioning to automated announcement systems, since this provides a direct comparison of automated stop announcements versus vehicle operator-based announcements. In such reviews, within the same agency, vehicles equipped with automated announcement far out-performed vehicles without such equipment, which instead had to rely on vehicle operators to announce stops and provide route identification information. *See, e.g.*, *FTA, Toledo Area Regional Transit Authority - Review of Route Identification and Stop Announcements* 25 & tbl. 4.1 (Nov. 28, 2011) (TARTA "Talking Bus" system properly announced the majority of stops on 45% of route segments, whereas, on vehicles without this system, operator performance was "poor," with 73% of route segments having no stop announcements); FTA, *Los Angeles County Metropolitan Transit Authority - Review of Route Identification and Stop Announcements* 24 (Sept. 30, 2010) (finding that, on transit buses equipped with automated announcement systems, all or most of the stops were

3.4. Final Rule – New or Revised Accessibility Requirements with Cost Impacts

The Access Board developed the final rule after careful review and consideration of comments received in response to the NPRM and the Preliminary RA. As with the proposed rule, most of the revisions in the final rule (relative to the existing 1991 and 1998 Vehicle Guidelines) are stylistic or editorial only, and are not expected to have an incremental cost impact. A side-by-side chart comparing the final rule with the existing 1991 and 1998 Vehicle Guidelines is available on the Access Board's website (www.access-board.gov). This chart identifies accessibility requirements in the final rule that have been changed (relative to existing vehicle guidelines), classifies changes as either editorial or substantive, and, if substantive, notes whether or not a changed requirement is expected to have a monetary (incremental) impact.

As an initial matter, it bears emphasis that only new or revised requirements likely to have incremental costs are evaluated in the Final RA. That is, some provisions in the final rule may be substantively different than the 1991 or 1998 Vehicle Guidelines, but are not expected to impose additional (new) costs relative to compliance costs under the existing regulations or industry practice. For example, under the final rule, the maximum running slope for ramps deployed to roadways is 1:6, while the existing guidelines permit such ramps to have steeper slopes (*i.e.*, 1:4 maximum). *Compare*, *e.g.*, T402.8.1 (final rule provision governing ramp slopes in roadway deployments) *with* 36 CFR 1192.23(c)((5) (existing ramp slope requirements for buses and vans), 1192.159(c)(5) (existing OTRB-related ramp slope requirements). However, due to a host of considerations, the Access Board anticipates that this revised requirement for ramps will have minimal cost impact. These considerations include: (i) the commercial availability of low floor non-rail vehicles equipped with 1:6 ramps, ranging in size from small cutaway buses to large, heavy-duty transit buses;[19] (ii) the commercial availability of compliant (1:6) ramps at lower cost than steeper ramps;[20] (iii) the existence of thousands of low floor non-rail

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properly announced on 89% of observed route segments; on buses operated by contractors without announcement system equipment, compliance was characterized as "low" with only 13% of route segments having similar stop announcement performance and 56% of route segments having no announcements).

[19] *See*, *e.g.*, Docket ## ATBCB-2010-004-0052 (comment submitted by Lift-U observing that "the majority of low floor bus manufacturers now offer a 1:6 ramp slope to the roadway"), -0078 (comment submitted by Ricon Corp.) & -0088 (comments by representatives from ARBOC Technologies, Dallas Smith Corp., and Lift-U at public information meeting). Online research by Access Board staff also found that, as of 2016, all major manufacturers of large, heavy-duty transit buses offer low floor bus models that accept drop-in modules for 1:6 ramps; most manufacturers of smaller cutaway buses also offer low floor models that can be equipped with 1:6 ramps.

[20] *See*, *e.g.*, Docket # ATBCB-2010-004-0052 (Lift-U comment noting that "there is relatively no change to the purchase price or maintenance costs per bus for [the company's] 1:6 ramp models"). In 2016, Access Board staff contacted several manufacturers who noted that, for heavy-duty low floor transit buses, 1:6 ramps are now generally less expensive than steeper (1:4) ramps, which are considered non-production, special order items. Current costs for 1:6 ramps are about equal to costs for 1:4 ramps when these latter types of ramps were still in regular production.

vehicles equipped with 1:6 ramps already in service nationwide;[21] and (iv) the listing of 1:6 ramps as the default specification for large low floor buses in the current version of APTA's "Standard Bus Procurement Guidelines."[22]

In summary, there are only five requirements (or sets of requirements) in the final rule that are expected to have an incremental cost impact—one that applies to large non-rail vehicles generally, and the remainder relating to new accessibility requirements for OTRBs.[23] First, with respect to large non-rail vehicles, the final rule—with some minor formatting and editorial changes—retains the same approach to automated announcement systems as the proposed rule. That is, under the final rule, "large transit entities" (as defined) will be required to provide automated stop and route announcements on all vehicles used in fixed-route bus service with multiple designated stops. *See* T215.3, T704.3, T704.5. Such automated announcement systems must notify passengers of upcoming stops and provide identifying route information in both audible and visible fashion. *Id*. Large transit agencies, in turn, are defined in the final rule as public transportation providers operating 100 or more buses in annual maximum service in fixed-route bus modes, through either direct operation or contract, as provided in required data reporting in the National Transportation Database. *See* T104.4 (defining "large transit entity"); *see also* 49 C.F.R. pt. 37 (regulations governing the DOT-administered National Transportation Database). These requirements for automated announcement systems are new regulatory requirements. As noted above, while existing DOT regulations mandate public and private entities operating vehicles in fixed route service make announcements for stops requested by an individual with a disability and for other specified route information (such as transfer points and major intersections), transit agencies are not required to equip their fixed route vehicles with *automated* announcement systems. *See* discussion *supra* section 3.1; *see also* 49 C.F.R. § 37.167(b) (DOT regulatory provisions stop and route announcements).

Additionally, for OTRBs, the Access Board anticipates that four requirements (or sets of requirements) in the final rule may have incremental cost impacts. These four requirements relate to:

- **Signage for Accessible Seating and Doorways**: Wheelchair spaces and doorways with accessible boarding and alighting features must be identified by the International Symbol of Accessibility, and priority seats (which are required only on non-rail vehicles used in fixed-route service) must be identified by signs informing other passengers that such seats are for use persons with disabilities. *See* T215.2.1, T215.2.2 & T215.2.3. While these requirements

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[21] *See*, *e.g.*, Docket ## ATBCB-2010-004-0082 (comment by Lift-U noting that, as of late 2012, there were about 6,500 1:6 ramps in service on low floor transit buses operated by over 400 transit agencies) & -0088 (statement by Lift-U representative at public information meeting).

[22] *See* APTA Standard Bus Procurement Guidelines, § TS 81.3 (May 2013), available at: http://www.apta.com/resources/standards/Documents/APTA%20Bus%20Procurement%20Guidelines.docx.

[23] Under the final rule, which incorporates the definition of certain terms from existing DOT regulations, "buses" are defined as "self-propelled vehicles, generally rubber-tired, intended for use on city streets, highways, and busways . . . used by public entities to provide designated public transportation service and by private entities to provide transportation service including, but not limited to, specified public transportation services." 49 C.F.R. § 37.3; *see also* T103.2 (incorporating DOT definitions of terms not otherwise defined in final rule). OTRBs, in turn, are a particular type of bus "characterized by an elevated passenger deck located over a baggage compartment." 49 C.F.R. § 37.3. OTRBs rarely (if ever) fall below 25-feet in length. Therefore, for purposes of evaluating the economic impact of the final rule, all OTRBs are deemed to be "large vehicles."

for identification of accessible seating and doorways have been in effect for buses and vans since the issuance of the 1991 Vehicle Guidelines, they are new requirements for OTRBs.

- **Exterior Destination and Route Signs**: Where destination or route signs are provided on the exterior of non-rail vehicles, such signs shall be located, at a minimum, on the front and boarding sides of the vehicle. *See* T215.2.4, T702. In other words, non-rail vehicles are not required to have destination/route signage on the exterior of the vehicle. However, if exterior route or destination signage is provided, it must be located at both locations (rather than only, for example, on the front of the vehicle). While this exterior signage requirement has been in effect for buses and vans since the issuance of the 1991 Vehicle Guidelines, this is a new requirement for OTRBs.
- **Public Address Systems**: Large non-rail vehicles operating in fixed route service with multiple designated stops must provide public address systems that are capable of broadcasting onboard announcement messages to passengers. *See* T215.3.1, T704.2. While this requirement has been in effect for buses and vans since the issuance of the 1991 Vehicle Guidelines, this is a new requirement for OTRBs.
- **Stop Request Systems**: Large vehicles operating in fixed route service with multiple designated stops and that stop on passenger request must provide stop request systems that afford audible and visible notification when passengers request to disembark. *See* T215.3.3, T704.4. While this requirement has been in effect for buses and vans since the issuance of the 1991 Vehicle Guidelines, this is a new requirement for OTRBs.

This Final RA estimates the incremental cost impact of, and qualitative benefits resulting from, these four requirements in the final rule that are newly applicable to OTRBs. The Preliminary RA, it bears noting, assessed only the cost impact of the automated announcement systems requirements proposed in the NPRM. At the time, our preliminary analysis indicated that the four new OTRB requirements would be either cost neutral or have costs not easily monetized. However, subsequent research and other information suggested that these requirements would, in fact, have modest incremental costs that could be monetized. Accordingly, the Final RA includes an evaluation of the economic impact of these four new OTRB requirements.

4. OVERVIEW OF COST METHODOLOGY

4.1. Automated Stop Announcement Systems – Large Transit Agencies

For purposes of assessing the likely economic (cost) impact of the revised requirement for automated stop and route announcements, the Final RA breaks down covered large transit agencies (*i.e.*, agencies operating 100 or more buses in annual maximum service as reported to the National Transit Database) into three "tiers" based on assumed fleet size –Tier I, II and III (with Tier I reflecting the smallest fleet size and Tier III the largest). *See infra* Table 2 (listing assumed characteristics of each tier). The Final RA then uses assumptions about the relevant characteristics of each of these three tiers of transit agencies—namely, the number of large buses, fixed routes, garages, vehicle operators, and mechanics per agency—along with estimates concerning the status and nature of current ITS deployments (if any) by these transit agencies, as the framework for modeling costs.

In addition to segregating covered transit agencies into these three size-based categories, the Final RA also employs several other notable approaches to modeling costs for automated announcement systems. First, the Final RA uses separate "low," "medium," and "high" cost estimates for most of the estimated components in the cost calculus in order to better reflect the potential range of incremental costs attributable to the requirement for automated announcement systems. Cost elements with L-M-H ranges include: onboard equipment; backend hardware; stop and announcement database development; backend system testing; initial training for vehicle operators and mechanics; ongoing operation and maintenance ("O&M") expenses; and mid-life equipment and software upgrades. Generally speaking, the "medium" cost estimates collectively serve as the primary baseline scenario in the Final RA when calculating incremental costs, while the "low" and "high" cost estimates respectively provide the lower- and upper-bound cost projections. Second, based on a 12-year average lifespan for most large, heavy-duty transit buses, the Final RA uses a 12-year regulatory cost (and benefits) time horizon, with covered transit entities assumed to replace an equal proportion ($1/12^{th}$) of their non-rail vehicle fleet annually.[24] While individual transit agencies may not replace a constant proportion of their bus fleet annually, an even distribution of fleet replacement provides a representative (*i.e.*, average) approach when abstracting across all agencies at the national level. Third, the analysis accounts for growth over time in the number of large transit agencies that would be affected by the revised requirement for automated announcement systems by assuming that, every third year during the regulatory timeframe, one transit agency would expand its fixed route buses fleet such that it would be deemed a large transit agency subject to the requirement for automated announcement systems.

Based on these modeling considerations, calculation of total annual costs for any particular tier/category of large transit agency in a given regulatory year follows a consistent pattern. Total annual costs for each tier represents the sum of the following costs, as applicable: annual costs for onboard bus equipment; one-time costs for development and testing of backend IT systems (including announcement databases); initial training for non-rail vehicle operators and mechanics on automated announcement system; annual O&M costs (onboard equipment and announcement databases); and mid-life equipment/software upgrade costs.

The next step in the cost modeling process, after the completion of calculations for annual costs in any given year, is to assess annual costs against a primary baseline. In this way, the resulting net costs appropriately reflect the incremental—rather than absolute—economic impact of the final rule. With respect to the revised requirement for automated announcements, the primary baseline is based on a conservative assessment of current ITS practice among large transit agencies nationally. Specifically, it is assumed large transit agencies that currently equip—or that have existing contracts or funding in place to equip—all newly acquired fixed route buses with automated announcement systems as part of an agency-wide ITS program will continue to do so in the future, and that such deployments are not attributable to the final rule. (Ongoing pilot or trial programs aimed at testing automated announcement systems on a segment of an agency's fixed route fleet would not be considered a current announcement system deployment.) Agencies that do not yet equip (or have firm plans to equip) their newly acquired fixed

[24] This 12-year service-life assumption is based on the service-life for large, heavy-duty buses set forth in FTA regulations that govern bus procurements using federal funds. *See* 49 C.F.R. § 665.11(e)(1). This 12-year service life assumption was also used in the Preliminary RA. *See* Preliminary RA at 13.

route buses with automated announcement systems, on the other hand, are assumed to acquire such systems on account of the final rule.

In sum, the foregoing represents the fundamentals of the Final RA's approach to modeling costs. Based on this model, annual costs are calculated for each of the twelve "regulatory years" and, within each of these years, separately for each of the three (*i.e.*, "high," "medium," and "low") cost scenarios. (Annual costs estimates for each L-M-H cost scenario are generated by respectively indulging all applicable "high" cost assumptions, all "medium" cost assumptions, and all "low" cost assumptions.) Annual cost totals for each year (and each L-M-H cost scenario) are presented as "rolled-up" costs for each category of large transit agency *(i.e.*, Tiers I, II & III). Additionally, the Final RA also presents a breakdown of annual costs for automated announcement systems under each L-M-H cost scenario for each of the three large transit agency tiers separately at 3% and 7% discount rates, as well as on an annualized basis.

4.2. Other Accessibility Requirements - Over-the-Road Buses

The methodology for assessing the economic impact of the four new requirements for OTRBs largely mirrors the cost methodology discussed above for automated announcement systems. Separate "low," "medium," and "high" unit cost assumptions are used to estimate costs relating to the revised requirements for identification of wheelchair spaces, exterior destination/route signage, public address systems, and stop request systems. Annual O&M costs are assumed to be a fixed percentage of total annual OTRB equipment costs using an L-M-H range. Similarly, covered OTRB agencies or companies are assumed to replace an equal proportion ($1/12^{th}$) of their non-rail vehicle fleet annually. In addition, the "medium" cost estimates collectively serve as the primary baseline scenario, while the "low" and "high" cost estimates respectively provide the lower- and upper-bound cost projections for OTRBs.

The main differences in the cost model for the revised requirements for OTRBs relate to assumptions about affected entities (primarily, OTRB firms), type of transportation service for which vehicles will be used, and typical features. First, since some of the new requirements apply to all OTRBs (*i.e.*, identification of wheelchair spaces and accessible doorways with the International Symbol of Accessibility (ISA), exterior destination/route signs) while others apply only to OTRBs used in fixed route service (*i.e.*, signs for priority seats, public address systems, stop request systems), the model incorporates assumptions regarding likely use to estimate compliance costs. For the requirements that exclusively apply to OTRBs used in fixed route service, only that segment of the total OTRB fleet nationally is assumed to incur related compliance costs. Additionally, the analysis also accounts for growth over time by applying L-M-H annual growth rates to the total fleet of OTRBs used in fixed route service. Second, the cost model incorporates assumptions about current practices in the OTRB manufacturing industry. Specifically, unit costs for OTRBs are scaled by the estimated respective likelihoods that the four new accessibility features required by the final rule are typically present on newly manufactured (or refurbished) OTRBs. Estimates for these likelihoods were developed based on information provided by OTRB manufacturers, as well as other publicly available information. As with most other estimated cost model components, these assumed likelihoods are applied using L-M-H ranges.

4.3. Small Business Analysis

As required by the Regulatory Flexibility Act (5 U.S.C. § 60 et. seq.) (RFA), as well as Executive Order 13,272 (Aug. 2002), the Final RA includes an evaluation of the economic (cost) impact of the final rule on small entities.[25] While this small business assessment necessarily draws on the Final RA's "main" cost model, it also incorporates data specific to small businesses. In sum, this small business analysis estimates the number of small entities to which the final rule will likely apply and assesses the likely economic (cost) impact of this rule. Key assumptions and methodologies underlying the small business analysis are summarized below.

First, the Access Board has determined that of the three types of RFA-defined small entities[26]—namely, small businesses, small nonprofit organizations, and small governmental jurisdictions—only small firms that provide transportation services using OTRBs will be potentially impacted by the accessibility requirements in the final rule. There are no nonprofit organizations, so far as the Access Board is aware, currently operating OTRBs in fixed route service in the United States. Additionally, by limiting the scope of the automated announcement systems requirement to large transit agencies (*i.e.*, transit agencies operating 100 or more buses in annual maximum service in fixed-route bus modes), the final rule excludes any small governmental jurisdictions to which such requirements might otherwise apply. "Small governmental jurisdiction," as defined in the RFA, refers to "cities, counties, towns . . . or special districts, with a population of less than fifty thousand." 5 U.S.S. § 601(5). Based on the current (2014) National Transit Database (NTD), all of the transit agencies that report operating 100 or more vehicles in annual maximum service (referred to as "VOMS") in fixed-route bus modes have service areas or urbanized area (UZA) populations over 50,000.[27]

Second, the Access Board has determined that private firms offering OTRB-provided transportation or other services are overwhelmingly small businesses. The extent to which the final rule's new OTRB-related accessibility requirements will potentially affect small businesses was estimated using pertinent transportation-related classification codes in the 2012 North American Industry Classification System (NAICS) in conjunction with SBA-defined small business size standards. Businesses often operate OTRBs for a variety of purposes, but predominant uses include: provision of fixed route passenger service within or among cities, passenger charter services, airport shuttle services, sightseeing tours, and

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[25] *See* 5 U.S.C. § 604; Exec. Order 13,272, 67 Fed. Reg. 53,461 (Aug. 16, 2002); *see* also *Small Business Administration, A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act* (May 2012), available at: https://www.sba.gov/sites/default/files/rfaguide_0512_0.pdf.

[26] *See* 5 U.S.C. §§ 601(3) - (6).

[27] *See* Federal Transit Administration, 2013 National Transportation Database – Agency Information, http://www.ntdprogram.gov/ntdprogram/datbase/2013_database/NTDdatabase.htm (last visited Jan. 11, 2016). Public transportation agencies that receive or benefit from federal formula grant programs for mass transportation in urbanized areas (49 U.S.C. § 5307) or rural areas (49 U.S.C. § 5311) are required to report specified financial and service data annually to the NTD. *See, e.g.*, FTA, *NTD Policy Manual – 2014 Reporting Year* 2-4 (Feb. 2015). The online NTD reporting requirements (absent a waiver from DOT) differ substantially for urbanized area and rural reporters, with the rural reporting module having a simpler format with fewer data fields for sub-recipient rural and tribal transit agencies. *Id*. at 10-16.

packaged tours.[28] While these services do not squarely align with any one classification in the 2012 NAICS, they best "map" to the following four 6-digit NAICS codes: 485113 (Bus and Other Motor Transit Systems); 485210 (Interurban and Rural Bus Transportation); 485510 (Charter Bus Industry); and 487110 (Scenic and Sightseeing Transportation, Land).[29] The SBA-defined "small business" standard for the three NAICS codes in the transit/ground transportation sector (i.e., 485113, 485210, 485510) is $15 million in per-firm average annual receipts, while the small business size standard for the fourth NAICS code in the scenic/sightseeing transportation sector (i.e., 487110) is $7.5 million.[30]

Using the foregoing SBA-defined small business size standards, data were compiled from the 2012 U.S. Economic Census (released in June 2015) to determine the number of small OTRB firms within each of these four transportation-related NAICS codes. A more detailed discussion of the methodology used in development of these small business statistics is provided in Appendix G. In sum, the SBA/Economic Census data show that firms within these four transit/transportation/charter/sightseeing industry sectors are overwhelmingly small businesses. The number and percentage of small businesses in each of the four NAICS codes are provided below in Table 1.

Table 1 – Total Number and Percentages of Small Businesses in Four OTRB-Related NAICS Codes

2012 NAICS Code	NAICS Description	Total Firms	Small Business Firms	Small Business Firms (% of Total Firms)
485113	Bus and Other Motor Vehicle Transit Systems	625	584	93.4%
485210	Interurban and Rural Bus Transportation	397	369	92.9%
485510	Charter Bus Industry	1,265	1,211	95.7%
487110	Scenic and Sightseeing Transportation, Land	543	517	95.2%

It bears noting that the four foregoing NAICS codes encompass transportation/charter/sightseeing services provided by vehicles other than OTRBs, such as trolley buses, transit buses, or historic rail cars. In other words, these NAICS codes are not restricted to transportation services provided exclusively by

[28] *See* American Bus Assoc., Motorcoach Census 2013 10-11 (Feb. 2014).

[29] *See* U.S Census Bureau, 2012 NAICS Definitions (undated), available at: http://www.census.gov/eos/www/naics/2012NAICS/2012_Definition_File.pdf (last visited: Jan. 11, 2016).

[30] *See* SBA, *Table of Small Business Size Standards Matched to North American Industry Classification System Codes* 26-27 (Feb. 26, 2016), available at: https://www.sba.gov/sites/default/files/files/Size_Standards_Table.pdf (last visited Apr. 1, 2016). The term "annual receipts," as used in SBA's small business size standards, consists of "total income" plus "cost of goods sold" as these latter two terms are defined in, and reported on, Internal Revenue Service tax forms. *See* 13 C.F.R. § 121.104.

OTRBs. However, there are no NAICS codes dedicated solely to OTRB-provided transportation, charter, or sightseeing services. Accordingly, despite their limitations, these four NAICS codes were adjudged to provide the best statistical framework (given current data limitations) for estimating the number of small firms that operate OTRBs and, thereby, may potentially incur compliance costs under the final rule.

Lastly, the Final RA's small business analysis incorporates data from the 2012 US Economic Census in one additional respect. Data on sales receipts and payroll for businesses in the four NAICS codes were used to derive statistics on per-facility annual receipts and per-facility annual payrolls among "small firms" and "other firms" within these respective industry sectors. (Because the US Economic Census data is presented in 2012 dollars, these data were "brought forward" to present dollars before these comparative per-facility receipts and payroll costs figures were derived.) The Final RA's small business assessment then uses these statistics to aid in assessing the economic impact of the new OTRB-related accessibility requirements in the final rule on small OTRB firms. The results from this small business analysis are presented in Section 9 below.

5. COST MODEL: DISCUSSION OF SIGNIFICANT ESTIMATED ELEMENTS

5.1. Vehicles

5.1.1. Transit Agencies and Vehicles Used in Fixed-Route Bus Modes

As noted above, the new requirement for automated announcement systems only applies to large transit agencies—that is, entities providing public transportation that operate 100 or more vehicles in fixed-route bus modes according to annual maximum service figures reported to the National Transportation Database (NTD) [hereinafter, "VOMS 100 threshold"]. Public transportation agencies that receive or benefit from federal formula grant programs for mass transportation in urbanized areas (49 U.S.C. § 5307) or rural areas (49 U.S.C. § 5311) are generally required to report specified financial and service data annually to the NTD.[31] Of pertinence here, the NTD includes data for four modes of service that involve fixed-route buses: traditional transit-style buses (coded "MB"), bus rapid transit (coded "RB"), commuter buses (coded "CB"), and trolley buses (coded as "TB"). The NTD is administered by the Federal Transit Administration.

To estimate the likely incremental cost from the new automated announcement system requirement, it was first necessary to determine the universe of potentially affected transit agencies. To this end, data from the 2014 NTD were downloaded that provide, among other things, each reporting entities' VOMS by mode of service.[32] Because the NTD's VOMS data is reported, for each transit agency, separately by mode of service and type of service (i.e., direct operation or contractor-provided transportation), for each transit agency offering more than one type or mode of fixed-route bus service, VOMS were totaled across all relevant bus mode and services. This 2014 NTD data show that there are 99 transit agencies currently meeting or exceeding the VOMS 100 threshold, thereby qualifying as "large transit agencies" under the final rule. These transit agencies are identified in Appendix A.

Second, to develop a baseline against which to estimate incremental costs for the automated announcement requirements, information was gathered on the current prevalence of automated announcement systems (or CAD/AVL systems) among these large transit agencies. For purposes of this Final RA, it is assumed that transit agencies that currently equip—or that have existing contracts or funding in place to equip—newly acquired vehicles operating in fixed-route bus service with automated announcement systems as part of an agency-wide ITS program will not incur incremental costs under the final rule. Access Board staff conducted research using publicly available information from the websites of transit agencies, equipment vendors and manufacturers, and other transit industry-related organizations, as well as supplementary information provided through communications with transit agency representatives, to assess existing (or planned) deployment of automated stop announcement systems or CAD/AVL across these large transit agencies' respective bus fleets.

From this research, assumptions were developed about the likely "inventory" of fixed-route vehicles acquired in the future by these large transit agencies that would not be equipped with automated stop

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[31] *See, e.g.*, FTA, *NTD Policy Manual – 2014 Reporting Year* 2-4 (Feb. 2015).

[32] Annual NTD databases, including the 2014 database, are available for download from the NTD program website. *See* DOT/FTA, NTD Data, http://www.ntdprogram.gov/ntdprogram/data.htm (last visited: Jan. 19, 2016).

announcements (absent the final rule), as well as the size and other pertinent characteristics of the large transit agencies likely to acquire and operate these vehicles. To provide a more refined picture of estimated costs to large transit agencies for automated announcements, these agencies are modelled using three prototypical categories (tiers) based on assumed VOMS for fixed-route bus service. The assumed bus fleet size and other characteristics of each of these three tiers is provided in Table 2 below.

Table 2 – Assumed Characteristics of Large Transit Agencies Subject to Automated Announcement Requirement, by Category (Tiers I, I & III)

	Number of Transit Agencies (Year 1)	Vehicles in Fixed-Route Bus Service (VOMS)	Fixed Routes	Garages	Vehicle Operators	Mechanics
Tier I	9	130	33	2	248	59
Tier II	6	273	70	5	520	124
Tier III	7	530	133	7	1,010	241

These three size-based tiers are intended to be representative of the types of large transit agencies operating fixed-route bus service in the United States. Assumptions about the number of transit agencies per tier and their respective bus fleets operating in fixed-route bus service represent a synthesis of Access Board research (described above) and 2014 NTD data on modes of bus service. The total of 22 large transit agencies across the three tiers, it should be noted, is not intended to reflect the actual number of large agencies that are believed (based on Access Board research) to still require automated stop announcement systems at this time. Rather, for modelling purposes, a conservative, estimated total "inventory" of fixed-route buses assumed to need automated stop announcement equipment from all large transit agencies (approximately 6,500) was proportionally distributed across the three modelled categories of large transit agencies.[33] Estimates of the number of fixed routes, garages, vehicle operators, and mechanics for each tier were derived by applying the same ratio of the particular characteristic (e.g., fixed routes, garages, and mechanics) to VOMS that was reflected in the transit agency sample data in the Preliminary RA (*see* Preliminary RA, Tbl. 5), with some small adjustments for rounding.

[33] This figure, which is drawn from Access Board research from publicly available information and information provided by several transit agencies, also finds implicit support in data from the *2015 APTA Vehicle Database* on the current state of deployments of automated stop announcement systems. According to this database, about 70% of existing fixed-route buses have stop announcement equipment installed. *See* APTA, *2015 APTA Vehicle Database – Equipment Data* (2015) (based on transit agencies reporting new data in 2014 or 2015). Based on 2014 NTD data, this equates to about 27,500 buses across the total VOMS for all large transit agencies (*i.e.*, 39,886 x .70). *See* Appendix A at A-4. The APTA database, however, reflects only existing installations of automated announcement system equipment; it does not capture transit agencies' ongoing fleet roll-outs for, or planned procurements of, automated announcement systems. When these near-term projected announcement system deployments are taken into account, the figure used in this analysis dovetails with reported existing deployments in the *2015 APTA Vehicle Database.*

The model also accounts for potential growth by public transit agencies by assuming that, every third year during the 12-year regulatory horizon of the final rule, a new large transit agency will cross the VOMS 100 threshold, and, thereby, be subject to the requirement for automated announcement systems. These "new" large transit agencies are assumed to have characteristics similar—though slightly less than—large transit agencies in "Tier I," based on the presumption that they would likely cross the VOMS threshold in an incremental fashion and thus be slightly smaller than a Tier I agency. The assumed bus fleet size and other characteristics of "new" large transit agencies that cross the VOMS threshold during the expected regulatory timeframe of the final rule is presented in Table 3 below.

Table 3 – Assumed Characteristics of "New" Large Transit Agencies that Cross VOMS 100 Threshold during Regulatory Timeframe

	Number of Transit Agencies (Year 1)	Vehicles in Fixed-Route Bus Service (VOMS)	Fixed Routes	Garages	Vehicle Operators	Mechanics
"New" Large Transit Agency	0	105	27	2	115	48

Assumptions about transit agency growth with respect to the likelihood of "crossing" the VOMS 100 threshold were approximated based on review of annual NTD data from 2012 to 2014. When a "new" large transit agency crosses the VOMS 100 threshold each third year, costs are assessed for one "new" transit agency with the foregoing characteristics under each L-M-H cost scenario.

Finally, it bears emphasis that the three-tier breakdown of large transit agencies (and their related assumptions about agency characteristics) is intended to reflect "average" large agencies likely to experience incremental costs under the new automated stop announcement requirement. These abstractions allow for estimation of costs without knowing the particular budget, procurement, geographic, or technical IT considerations that may play into each agencies' respective decisions about ITS deployments generally, or automated announcement systems in particular. Moreover, by segmenting large transit agencies into these three tiers, covered transit agencies will presumably get a better sense of their respective potential costs from the new automated announcement requirement than were a single "average" large transit modeled.

5.1.2. OTRBs

There are two main estimated elements used in the cost model that relate to the "inventory" of OTRBs likely to incur incremental costs from new accessibility requirements in the final rule—the size of the U.S. OTRB fleet and the proportion of this fleet that operates in fixed-route service.

First, with respect to fleet size, estimates regarding the number of existing OTRBs were drawn from the *2014 Motorcoach Census* published by the American Bus Association Foundation.[34] This census states that, as of calendar year 2013, there were 32,811 motorcoaches in the United States.[35] However, since this is a point-in-time figure, data from preceding *Motorcoach Censuses* were consulted to develop estimated growth (or contraction) rates in the OTRB industry. This annual census data from 2010 through 2013 show that the OTRB industry has experienced some decline over the past several years in terms of total companies and vehicles. Specifically, the year-over-year OTRB fleet size has decreased each year, with a 4-year annual average of - 3.8% growth in fleet size. [36]

However, it cannot be confidently predicted that the same market forces underlying recent consolidation and declining growth in the OTRB industry will persist long term. Accordingly, the Final RA conservatively assumes that this trend will moderate to some extent over the 12-year regulatory horizon, with each L-M-H cost scenario using slightly different assumptions about OTRB growth rates. Specifically, for purposes of modelling costs for new requirements in the final rule applicable to OTRBs, the respective cost scenarios assume that the total U.S. OTRB fleet will annually grow or contract as follows: - 1.0% (low scenario); 0.0% (primary scenario); 1.0% (high scenario).

Since the *2014 Motorcoach Census* reflects only the size of the OTRB fleet in calendar year 2013, the foregoing growth rates were applied to the 2013 fleet size figure (32,811) to bring it forward to the present year. This methodology results in assumptions about the current size of the OTRB fleet in the United States as provided below in Table 4.

Table 4 - Estimated Size of Total OTRB Fleet in the United States, 2015

	Low Scenario	Primary Scenario	High Scenario
Number of OTRBs	31,836	32,811	33,804

The preceding OTRB fleet sizes are assumed for "Year 1" of the final rule. In each subsequent year over the 12-year regulatory timeframe, the applicable growth for each cost scenario is applied to the prior year's OTRB fleet to derive the size of the OTRB fleet for that regulatory year.

Second, since some (but not all) of the new accessibility requirements for OTRBs in the final rule apply only to vehicles used in fixed-route service, it was necessary to develop estimates regarding the proportion of the OTRB fleet used in fixed-route service. There are no definitive sources for such data. However, based on a synthesis of information provided in various research studies, the cost model

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[34] The American Bus Association Foundation has published a Motorcoach Census annually since 2010. The *2014 Motorcoach Census* is available at http://www.buses.org/assets/images/uploads/general/Report%20-%20Census2013data.pdf. The *Motorcoach Census* for prior years (i.e., 2010 – 13) is also available on the ABA's website at http://www.buses.org/aba-foundation/research-summary/size-and-scope.

[35] *Id*. at 9.

[36] *Id*. at 20.

assumes that 30% of OTRBs in any given year under each cost scenario are used primarily in fixed-route service.[37]

5.2. Automated Announcement Systems

The cost model used in the Final RA to estimate likely incremental costs for the new automated announcement system requirement largely follows the approach used in the Preliminary RA, with three exceptions. First, unit costs from the Preliminary RA (which was authored in 2010) were brought forward to the present. Second, the Final RA adds a third cost scenario, thereby estimating costs across an L-M-H range. Third, because the Final RA models costs for three sizes of transit agencies (rather than one), unit costs are scaled by size over the size-based tiers.

The assumptions and methodology underlying the Final RA's approach to modeling the incremental costs of the automated announcement systems requirement are briefly summarized below. However, given that this analysis relies heavily on the methodology used in the Preliminary RA, review of the Preliminary RA will also likely aid in understanding the cost estimation process. A complete list of unit costs used in the Final RA for automated announcement systems, as well as a brief description of their underlying assumptions, is provided in Appendix B.

5.2.1. Initial Costs – Onboard Equipment and Backend Systems

The cost components for deploying an automated announcement system on fixed-route buses can be broken down into two main areas—onboard equipment, and so-called "backend" IT systems supporting the requisite stop and announcement databases. Based on unit cost information developed by the Volpe Center, the Preliminary RA estimated costs for the automated announcement systems requirement based on "low" and "high" cost scenarios.[38] For the "low" scenario, it was assumed that the transit agency already deploys a CAD/AVL system on its fixed-route buses, has established backend systems to communicate data, can use an existing stop database (with geocoded locations), and has operator call sheets to readily develop an announcement database.[39] The "high" scenario, by contrast, assumed that the transit agency has no existing ITS systems in place and thus must "start from scratch" in the development of an automated announcement system.[40]

The Final RA maintains these same sets of assumptions when modelling costs for automated announcement systems under the "low" and "high" scenarios. The cost model also introduces, however, a

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[37] *See, e.g.,* ABA, *2014 Motorcoach Census* at 12 (noting that about 34% of motorcoach service mileage in calendar year 2013 attributed to "scheduled service," and 6% to "commuter" service); Kathryn J. Ready, *The Impact of Consolidation and Strategic Considerations in the Motorcoach Industry*, 1 Intl. Bus. & Econ. Research J. 89, 90 (2011) (estimating about 25% of OTRBs used in fixed-route operations); KFG Group, *Cost of Meeting Accessibility Requirements for Over-the-Road Buses* 3-8, 3-12 (April 2000) (estimating, as part of economic analysis of then-new 1998 DOT final accessibility regulations applicable to OTRBs, that 29% to 33% of OTRBs were primarily used in fixed-route service).

[38] *Preliminary RA* at 1.

[39] *Id*. at Table 6 (cost factors).

[40] *Id*.

"primary" (or medium) cost scenario. This scenario has been added to reflect the fact that, since 2010 (when the Preliminary RA was published), the deployment rate for CAD/AVL on fixed-route buses has expanded rapidly. In 2010, 66% of fixed-route buses were equipped with AVL, while, in 2013, nearly 90% of such buses had AVL.[41] Given this high AVL deployment rate on existing fixed-route buses, it is most likely that large transit agencies affected by the new requirement for automated announcement systems will not need to "start from scratch" to comply with this requirement, but, rather, can build from an existing ITS infrastructure. Consequently, the most likely scenario for overall compliance costs under the automated announcement systems requirement across all large transit agencies is that agencies will experience a "mix" of costs—namely, the majority of agencies will incur costs similar to the "low" scenario (because they already deploy AVL), and a few will still incur costs similar to the "high" scenario (because they do not yet have an existing ITS infrastructure).

The "primary" scenario in the Final RA is intended to capture this "mix" of compliance costs that will most likely be incurred under the automated announcement systems requirement. Specifically, the cost model for the primary scenario assumes that one-half of affected large transit agencies will experience costs for automated announcement systems similar to the "low" scenario, and the other half will experience costs similar to the "high" scenario. While the primary scenario could have assumed upwards of 90% of large transit agencies would experience costs similar to the "low" scenario given current AVL deployment rates, the 50/50 ratio of "low" to "high" cost assumptions was used instead to be conservative and to acknowledge that, when dealing with ITS integration issues (i.e., adding a new automated announcement system to an existing ITS deployment), things may not always go smoothly.

In practical effect, the cost approach taken under the "primary" (medium) cost scenario in the Final RA means that, for any costs which are scenario-based (*i.e.*, have differing values under "low" and "high" cost assumptions), costs are pulled equally from the "low" and "high" cost assumptions. There are five cost components related to initial deployment of automated announcement systems for which values differ under "low" and "high" cost assumptions. These five cost components are: onboard bus equipment; WLAN systems; stop database consolidation and geocoding labor costs; labor costs for setting up an announcement database; and, labor costs for system testing.[42]

In terms of unit costs, all three L-M-H scenarios modeled in the Final RA include initial (one-time) unit costs to equip new buses and to set-up backend systems to support stop and announcement databases. Unit costs from the Preliminary RA served as the framework for development of these unit costs in the Final RA, with some updating (to account for the passage of time) and adjustments (to account for the introduction of a "primary" scenario and three size-based transit agency "tiers"). In summary, unit costs in the Final RA for initial deployment of automated announcement systems reflect the following changes (relative to the Preliminary RA):

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[41] *Compare* DOT, FHWA-JPO-14-146, *Deployment of Intelligent Transportation Systems: A Summary of the 2013 National Survey Results* xiv, 27 (Aug. 2014) *with* DOT, FHWA-JPO-11-132, *Deployment of Intelligent Transportation Systems: A Summary of the 2010 National Survey Results* 31-32 (Aug. 2011).

[42] *See Preliminary RA* at Tbl. 6 (cost factors); *see also* Appendix B.

- ***Updating Unit Costs from Preliminary RA to Reflect the Passage of Time***: All unit costs from the Preliminary RA were brought forward to the present using the online CPI Inflation calculator tool provided on the Bureau of Labor Statistics (BLS) website;[43]

- ***Incorporation of a "Primary" Cost Scenario***: As noted above, the Final RA adds a "primary" (medium) cost scenario which, for unit costs that are scenario-based (i.e., have differing "low" and "high" cost assumptions), assumes that costs are pulled equally from "low" and "high" cost assumptions. Under the primary scenario, these "low" and "high" unit costs are based on the respective "low" and "high" unit costs in the Preliminary RA, as updated by the BLS CPI Inflation Calculator;

- ***Slight Upward Adjustment of Unit Costs Under "High" Scenario***: Because the primary scenario pulls costs, in part, from the "high" cost assumptions used in the Preliminary RA, a different set of "high" unit costs was needed for the Final RA. In the Final RIA, "high" unit costs are assumed to be 10% higher than "medium" costs under the primary scenario. Accordingly, "high" unit costs in the Final RA are calculated as follows: Unit Cost for Initial Cost Component X = (unit cost for Component X in Preliminary RA under "high" scenario) x (BLS CPI Inflation Rate) x (10%). This slight upward adjustment in unit costs under the "high" scenario in the Final RA ensures that the upper-bound estimate for likely costs for the final rule remains a conservative estimate; and

- ***Scaling of Certain Size-Based Unit Costs for Transit Agencies in Tiers I and III***: Since the Preliminary RA assessed costs based on the assumed characteristics of a single "sample" transit agency, unit costs were necessarily tailored to agencies of that one size. The Final RA, in contrast, assesses costs across three size-based categories of large transit agencies. Unit costs in the Final RA for some cost components thus needed to be scaled because they would not otherwise properly account for likely costs variances due to agency size.[44] In the Preliminary RA, there are four cost components related to initial deployment of automatic announcement systems that are assumed to require scaling for transit agency size: Software & Hardware; Stop Database Setup/Consolidation; Announcement Database Setup; and, System Testing. *See* App. B-2, Initial (One-Time) Costs for Backend Systems.

  By design, the size (in terms of fixed-route bus fleet) and other pertinent characteristics of "Tier II" transit agencies in the Final RA mirror the "sample" transit agency modeled in the Preliminary RA.[45] Therefore, scaling of costs is only needed when calculating costs for Tier I (i.e., relatively smaller) and Tier III (i.e., relatively larger) transit agencies. Under all L-M-H scenarios, unit costs for Tier I agencies for these four size-dependent cost elements are scaled by .75 to reflect

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[43] The BLS CPI Inflation calculator is available at http://www.bls.gov/data/inflation_calculator.htm.

[44] Size-dependent cost components are those elements that are expected to vary based on agency size and which do not automatically adjust for scale. For example, costs that are calculated on a per-item basis, such as onboard bus equipment (assessed per bus), GPS receivers (per bus), WLAN systems (per garage), "automatically" adjust for the size of the transit agency because they necessarily depend on the number of buses to be equipped or garages in which networking equipment will be housed.

[45] *See Preliminary RA* at 10.

their relatively smaller size. For Tier III agencies, unit costs for these same four cost elements are scaled by 1.25 to account for their larger size.

In sum, the foregoing revisions represent all changes to unit costs estimates in the Final RA for initial (one-time) costs related to the deployment of automated announcement systems. A complete list of unit costs used in the Final RA to assess the incremental costs of the automated announcement systems requirement is provided in Appendix B, along with brief descriptions of their respective underlying assumptions.

5.2.2. Training and Other Labor Costs

Labor costs are reflected in several cost items used to assess incremental costs for compliance with the new requirement for automated announcement systems. First, the Final RA assumes that each transit agency initially deploying an automated announcement system to comply with the final rule will incur one-time costs to train vehicle operators and mechanics on these systems.[46] Hourly labor costs for these occupations were derived from May 2014 Occupational Employment Statistics (OES) data published by the Bureau of Labor Statistics.[47] The primary scenario is based on the median national hourly wage, while the low and high scenarios respectively use hourly wages at the 25th and 75th percentiles nationally. All OES-based hourly wages were multiplied by 1.5 to adjust for benefits (which was same multiplier used in the Preliminary RA).

The resulting "fully loaded" hourly wages for vehicle operators and mechanics, as used in the Final RA, are:

Table 5 - Estimated Hourly Wages for Vehicle Operators and Mechanics

	Low Scenario	Primary Scenario	High Scenario
Vehicle Operators	$19.55	$27.03	$35.94
Mechanics	$25.04	$31.47	$39.47

The foregoing methodology used in the Final RA to estimate wage rates for vehicle operators and mechanics mirror the approach taken in the Preliminary RA except that, here, updated (2014) OES wage

[46] *See* Appendix B, which details the estimated training needs of vehicle operators and mechanics. In sum, it is assumed that all vehicle operators will receive one hour of training on their transit agencies' respective automated announcement systems, while 10% of agencies' mechanics will receive an equivalent amount of training on repair and maintenance of such announcement systems. This mirrors the assumptions used in the Preliminary RA. *See Preliminary RA* at 12.

[47] The BLS provides an online tool, called the "Occupational Employment Statistics Query System," through which generates custom tables with OES wage data based on user-provided specifications. *See* BLS, OES Query System, http://data.bls.gov/oes/ (last visited: Jan. 19, 2016). The following Standard Occupation Classifications (SOC) codes were used to generate the OES wage data for vehicle operators and mechanics: 53-3021 (Bus Drivers, Transit and Intercity) and 49-3031 (Bus and Truck Mechanics and Diesel Engine Specialists).

data is used and percentile (rather than average) wage data forms the basis for the "low" and "high" scenarios respectively.[48]

Second, labor costs are also embedded in certain cost calculations relating to setup of backend systems. Specifically, the respective unit costs for setting up an announcement databases and for system testing assume that the efforts of an IT/GIS specialist and IT Project Manager will be needed, with the number of hours varying by scenario.[49] The Final RA uses wage data from the May 2014 National Industry-Specific Occupational Wage Estimates (OES) tables to derive labor costs for these IT professionals.[50] The primary scenario is based on the median national annual wage, while the low and high scenarios respectively use annual wages at the 25th and 75th percentiles nationally. Annual OES-based wage rates were multiplied by 1.5 to adjust for benefits.[51]

The resulting "fully loaded" annual wages for an IT/GIS Specialist and IT Project Manager, as used in the Final RA, are:

Table 6 - Estimated Annual Wages for IT/GIS Specialist and IT Project Manager

	Low Scenario	Primary Scenario	High Scenario
IT/GIS Specialist	$83,955	$106,890	$134,595
IT Project Manager	$119,938	$152,703	$192,282

As with training cost assumptions, the methodology used to estimate annual wages for these two IT professions mirrors the approach taken in the Preliminary RA except that, here, updated (2014) OES wage data is used and percentile (rather than average) wage data forms the basis for the "low" and "high" scenarios respectively.[52]

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[48] *See Preliminary RA* at 12 & App. C. The Preliminary RA used the same average OES wage rates for both "low" and "high" scenarios.

[49] *See* Appendix B, which details the assumed labor hours respectively needed by IT/GIS Specialist and IT Manager under each scenario. In sum, the "low" scenario assumes that the transit agency has up-to-call sheets that can be readily entered into an announcement database (thereby calling for less work by IT professionals) and minimal system testing is required. The "primary" and "high" scenarios, on the other hand, assume more time is needed by IT professionals because, for example, more intensive system testing is required and the transfer of data from the scheduling database (i.e., HASTUS) to the announcement database does not go smoothly due to mismatching database schema. *Id*.

[50] Specifically, for the IT/GIS Specialist position, wage date was obtained from BLS National Industry-Specific Occupational Wage Estimates for SOC 151140 (Database Administer) in NAICS Sector 999300 (Federal, State, and Local Government). *See* BLS, May 2014 National Industry-Specific Occupational Employment and Wage Estimates - NAICS 999300, available at: http://www.bls.gov/oes/current/naics4_999300.htm. For the IT Manager, because OES wage data has no specific classification this position, wage rates were assumed to be 1.4 times the wage of an IT/GIS Specialist. This replicates the wage ratio for these two IT positions in the Preliminary RA. *See* Preliminary RA, App. C.

[51] *See Preliminary RA* at App. C.

[52] *See* Preliminary RA at App. C. The Preliminary RA used the same average annual wage rates for both "low" and "high" scenarios.

5.2.3. Operations & Maintenance

Automated announcement systems—as with any IT system—require some measure of ongoing operation and maintenance (hereafter, "O&M"). These O&M efforts may take several forms. First, transit agencies periodically update schedules and routes, which may result in changes in bus stops, and therefore, require updating of stop and announcement databases. At many transit agencies, these updates occur quarterly. Backend systems also require routine software and hardware maintenance. As well, onboard bus equipment needs to be maintained and, when needed, repaired. Information provided by transit agencies, as well as other Access Board research on the reliability of automated announcement systems, suggests that onboard equipment typically has a low failure rate.

Accordingly, the Final RA incorporates annual O&M expenses into the cost model for each L-M-H scenario. Annual O&M costs have three components: spare parts (equipment cost); maintenance/repair of onboard bus equipment (labor cost); and periodic maintenance of stop and announcement databases and related backend hardware and software (labor cost). A complete discussion of the assumptions used to calculate these O&M-related equipment costs and labor costs are detailed in Appendix B. These assumptions are generally the same as those used in the Preliminary RA except for updating of labor rates to reflect current (2014) OES wage data, and use of L-M-H cost scenarios (rather than dual L-H cost scenarios).

5.2.4. Mid-Life Software Upgrade

The final component of the cost calculus for the automated announcement system requirement concerns the likely need for a mid-life software upgrade for onboard bus equipment (i.e., integrated system controller) and backend systems. In sum, the Final RA assumes that upgrade costs are incurred every 5-6 years, with such costs apportioned equally between the 5th and 6th in-service years. Unit costs for mid-life software upgrades are based on cost estimates used in the Preliminary RA, as adjusted for inflation. Additionally, because the Preliminary RA did not vary unit costs for mid-life software upgrades between scenarios, it was necessary to develop new cost assumptions for the "low" and "high" scenarios. These new unit cost estimates were derived by using unit costs under the primary scenario as the base, then subtracting 10% (low scenario) or adding 10% (high scenario) to create a L-M-H range of cost scenarios. (A complete discussion of the assumptions used to calculate unit costs for mid-life software upgrades to onboard equipment and backend systems is detailed in Appendix B.)

Based on the foregoing, the Final RA uses the following unit cost estimates for mid-life software upgrades to onboard equipment and backend systems:

Table 7 - Estimated Mid-Life Software Upgrade Costs (Onboard Equipment & Backend Systems)

	Low Scenario	Primary Scenario	High Scenario
Onboard Bus Equipment (per bus)	$142	$158	$174
Backend Systems	$1,390	$1,544	$1,698

	(per agency)

5.3. Over-the-Road Buses – New Requirements for Onboard Accessibility Features

Assessment of costs related to the four accessibility requirements in the final rule expected to have an incremental cost impact on OTRBs—wheelchair space identification; exterior destination/route signs; public address systems; and stop request systems—generally follows the same methodology used to estimate unit costs for automated announcement systems. Cost estimates for these four requirements include one-time costs to equip new OTRBs, as well as annual O&M costs throughout the 12-year regulatory timeframe.[53] One area in which the cost estimation methodologies differ, however, is the incorporation of the likelihood that a new OTRB will need to incur compliance costs. In other words, estimates of incremental costs for new OTRB accessibility requirements take into account the "real world" likelihood that a typical new vehicle will both have a particular covered element **and** be affected by the new accessibility requirement (*i.e.*, will incur compliance costs that otherwise would not have been incurred absent the final rule).

Key features of the assumptions underlying cost estimates for the four new OTRB accessibility requirements are summarized below. In addition, a complete list of unit costs used in the Final RA for these requirements, as well as brief descriptions of their respective underlying assumptions, is provided in Appendix C.

5.3.1. Unit Costs

Because the new OTRB accessibility requirements involve discrete features or pieces of equipment (rather than whole IT systems), their corresponding cost estimation calculations are also, generally speaking, less complex. Unit cost estimates for OTRB equipment needed to comply with each of these four accessibility requirements are based on discussions with, or information provided by, OTRB manufacturers and vendors. Unit costs simply reflect, with one exception, the cost of equipping one, new OTRB with the requisite feature or equipment.

No separate (or additive) labor costs are assumed for any of the four requirements with the exception of the requirement for identification of accessible seating and doorways with signs (i.e., priority seats) or the International Symbol of Accessibility (ISA) (i.e., wheelchair spaces and accessible doorways). Online research conducted by Access Board staff of OTRB manufacturers' websites, along with supplementary information provided by OTRB manufacturers and transit entities, established that bus manufacturers typically install exterior destination/route signage, public address systems, and stop request systems when

[53] Because the Preliminary RA did not evaluate costs related to compliance with OTRB accessibility requirements in the proposed rule, the OTRB-related cost methodology and assumptions in the Final RA are necessarily new to this assessment. That said, this methodology is generally consistent with the approach taken in the Preliminary RA for estimating costs for automated announcement systems.

the bus is built per standard configuration or customer specification. For such Original Equipment Manufacturer (OEM)-installed equipment, there is no separate labor cost. No such practice for OEM-installed identification of accessible seating and doorways was found. Accordingly, it is assumed that affixing the requisite signage for priority seats (e.g., sign informing transit users that such seats are for use by persons with disabilities), along with identification of wheelchair spaces and accessible doorways (e.g., sign or decal with International Symbol of Accessibility), will be an after-market installation performed by mechanics employed by the vehicle owner. The time needed by mechanics to affix the requisite identifying signs or decals for accessible seating and doorways is, under all three L-M-H scenarios, estimated to be 30 minutes per vehicle.

Unit costs related to the new OTRB requirements were developed from information provided by OTRB bus manufacturers and equipment vendors, as supplemented by online research conducted by Access Board staff. With respect to the signage requirements related to accessible seating and doorways, unit costs were developed solely from these sources. For the remaining OTRB-related accessibility requirements (*i.e.*, exterior destination/route signs, public address system, and stop request system), only unit costs for the primary scenario are based on these sources. Unit costs for the "low" and "high" scenarios are assumed to be +/- 20% of costs under the primary scenario.

A complete list of unit costs used in the Final RA for equipment related to the four new accessibility requirements for OTRBs, along with brief descriptions of their underlying assumptions, is provided in Appendix C. In sum, unit costs used in this analysis to evaluate the likely respective incremental costs of these four new requirements are:

Table 8 – Per Vehicle Unit Costs for Equipment Related to New OTRB Accessibility Requirements

	Low Scenario	Primary Scenario	High Scenario
Identification of Wheelchair Spaces and Accessible Doorways (ISA Signs/Decals)	$9	$18	$30
Priority Seating Signs	$30	$70	$110
Exterior Destination/Route Signs	$640	$800	$960
Public Address System	$600	$750	$900
Stop Request System	$240	$300	$360

5.3.2. Likelihoods for Incurring Compliance Costs

As noted above, the Final RA's cost model does not assume that every new OTRB manufactured during the 12-year regulatory timeframe will incur compliance costs under the final rule. Rather, only OTRBs likely to incur costs attributable to one or more of the four new accessibility requirements experience compliance costs for requisite equipment. Compliance costs are assumed to be attributable to the final rule only if a covered OTRB would not be expected to be outfitted with the feature/equipment at issue in the normal course of business or industry practice. Likelihoods of incurring compliance costs for

OTRB accessibility requirements are thus a function of whether such vehicles (a) have a given feature/element covered by the final rule, and (b) would not typically have the requisite accessibility equipment required by the final rule.

Estimates of likelihoods for incurring compliance costs related to the four new OTRB accessibility requirements in the final rule are drawn from Access Board research, as well as information provided by OTRB manufacturers and equipment vendors. As reflected in the table below, the relative likelihood of any particular OTRB incurring compliance costs under one or more of the four new accessibility requirements varies greatly between requirements. This disparity reflects research-based estimates that most new OTRBs are already likely to be outfitted with equipment complying with certain accessibility requirements (e.g., stop request systems), while, for other requirements, such likelihoods are much lower or even non-existent (i.e., identification of wheelchair spaces, exterior destination/route signage). Also playing a role in likelihoods is the intended use of an OTRB. For example, most OTRBs used in fixed-route service as commuter buses are already equipped with exterior destination/route signs on both the front and boarding side of the vehicle, but, for OTRBs intended solely for charter use service, exterior destination/route signage on the front of the vehicle only is more the norm.[54]

Presented in the Table 9 below are the likelihoods used in the Final RA for incremental cost calculations under each L-M-H cost scenario for the four new OTRB accessibility requirements. A full discussion of the assumptions underlying the estimation of likelihoods for each of these four requirements is presented in Appendix D.

Table 9 – Likelihood of OTRB Incurring Compliance Costs under Each New Accessibility Requirement, Per Vehicle

	Low Scenario	Primary Scenario	High Scenario
Identification of Wheelchair Spaces and Accessible Doorways (ISA)	100.0%	100.0%	100.0%
Priority Seating Signs	27.0%	28.5%	30.0%
Exterior Destination/Route Signs	35.0%	45.0%	55.0%
Public Address System	2.0%	5.0%	8.0%
Stop Request System	25.5%	27.0%	28.5%

In practical effect, the foregoing likelihoods work to "scale" (adjust) incremental costs for requirements so that to they reflect current industry trends and practice. Likelihoods are applied to the number of new OTRBs in any given year as a means of estimating the number of vehicles that will incur compliance costs. For example, the primary scenario assumes that, in "Year 1" of the final rule, 820 OTRBs will be manufactured. With respect to the stop request system requirement, application of the 27% likelihood associated with this requirement under the primary scenario (listed in Table 9, above) leads to a total 211

[54] *See* discussion in Appendix D.

ORTBs (.27 x 820) that are assumed to incur incremental costs related to the stop request equipment in that regulatory year.

5.3.3. Operation & Maintenance

Assessment of annual O&M costs related to the new OTRB accessibility requirements proceeds according to a straightforward process. Costs for maintenance or repair of equipment needed to comply with these accessibility requirements (e.g., window decal, public address microphone or speakers, stop request indicator) is assumed to be a percentage of annual equipment costs, with these O&M percentages varying slightly by cost scenario.

The Final RA assumes that O&M costs for equipment needed to comply with the new OTRB accessibility requirements will be incurred on an annual basis, with percentages based on total equipment costs for OTRBs in any given year. Estimated annual O&M costs under each scenario are as follows:

Table 10 – Estimated Annual O&M Costs for new OTRB Accessibility Requirements

	Low Scenario	Primary Scenario	High Scenario
Annual O&M Costs (as percentage of OTRB equipment)	1.0%	2.0%	3.0%

6. BENEFITS: A QUALITATIVE & QUANTITATIVE PERSPECTIVE

The Access Board believes that the revised accessibility guidelines in the final rule will directly benefit a significant number of Americans with disabilities by ensuring that public transit buses and OTRBs are accessible and usable. By addressing communication barriers (and, to a lesser extent, access barriers) encountered on such vehicles by persons with vision, hearing, mobility, and cognitive impairments, the final rule will better enable persons with such disabilities to use these modes of transportation to work, pursue an education, access health care, worship, shop, or participate in recreational activities. Other individuals or entities, such as transit agencies, will also likely incur benefits through, for example, improved customer satisfaction attributable to automated announcement systems. However, for several reasons, benefits accruing from the final rule cannot be reliably monetized. Consequently, this Final RA summarizes the expected benefits from the final rule in qualitative, and, where possible, quantitative terms.[55] Additionally, several threshold (breakeven) analyses are presented to demonstrate the net social value of the final rule from an economic perspective.

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[55] *See, e.g.*, Exec. Order No. 13,563, Improving Regulation and Regulatory Review § 1(c), 76 Fed. Reg. 3821 (Jan. 21, 2011) (counselling that, where permitted by law, agencies should "consider (and discuss qualitatively) values that are difficult or impossible to quantify, including equity, human dignity, fairness, and distributive impacts"); Exec. Order No. 12,866, Regulatory Planning and Review § 1(a), 58 Fed. Reg. 51,735 (Oct. 4, 1993) (same); *see also* Office of Mgmt. & Budget, Circular A-4, Regulatory Analysis 26-27 (Sept. 17, 2003)

6.1. General Discussion

Benefits of the final rule are particularly challenging to quantify and monetize due to multiple considerations. These challenges include: (a) a lack of current, reliable statistics on ridership by persons with specific disabilities on fixed-route transit buses and OTRBs; (b) the fact that persons with disabilities will experience benefits differently, depending on the nature of their respective disabilities, current level of accessibility provided by the transit system or OTRB they wish to use; (c) the unknown extent to which improved accessibility of fixed-route transit buses and OTRBs may either spur new demand among persons with disabilities who do not currently ride such vehicles due to accessibility barriers that are addressed by the final rule, or increase demand among current riders with disabilities;[56] (d) the extent to which persons with disabilities have reliable access to transportation (since, even when accessible, vehicles cannot be used if a potential passenger cannot reach them); (e) personal transportation preferences of persons with disabilities, who, like all passenger, make transit decisions for multiple reasons, some of which are unrelated to accessibility; and (f) the inherent challenges posed by monetization of key benefits of the final rule, such as equity, fairness, independence, and better integration into society.

While the foregoing factors make formal quantification or monetization of the final rule's benefits inherently difficult, it is nonetheless still possible based on current information to provide a broad framework for understanding the potential pool of persons with disabilities who may benefit, to a greater or lesser extent, from new accessibility requirements in this rule.[57] First, the most significant benefits from the final rule are expected to flow from the automated stop and route announcement systems

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(acknowledging that "some important [regulatory] benefits . . . may be inherently too difficult to quantify or monetize given current data and methods").

[56] Indeed, some transportation-related research studies suggest that there is latent demand among persons with disabilities to use fixed-route transit bus service, or use it more frequently. *See* TRB, TCRP Report 163, *supra* note 6, at 12-14 (finding, based on national survey of persons with disabilities, that majorities of individuals who currently use fixed-route transit only or who use both fixed-route transit and paratransit services wished to use fixed-route transit service more frequently; also finding, based on same survey, that nearly 40% of non-users of public transit wished to start using fixed-transit service). While survey respondents cited various barriers to greater use of fixed-route service, about one-half noted "problems with stop announcements" as a "very important" or "important" factor in their decision to use fixed-route transit services. *Id*. at 16.

[57] Benefits likely to accrue from the final rule's specification of a 1:6 maximum running slope for non-rail vehicle ramps are not discussed in this section. To be sure, both commenters and published studies attest that a 1:6 maximum ramp slope makes ramps safer and more usable for most passengers who use wheeled mobility devices relative to existing transportation vehicle guidelines. *See*, *e.g.*, Karen L. Frost, et al., *Ramp-Related Incidents Involving Wheeled Mobility Device Users During Transit Bus Boarding/Alighting*, 96 J. Physical Med. & Rehabilitation 928 - 33 (2015); *see also* Preamble to Final Rule – Americans with Disabilities Act Transportation Vehicle Guidelines, Section III (Major Issues – Running Slope of Ramps Deployed to Roadways or Curb-Height Bus Stops) (discussing comments related to Access Board's proposal to specify 1:6 as the maximum slope of ramps in non-rail vehicles). However, since it is believed that a 1:6 maximum ramp slope will not have a significant incremental cost impact, we do not monetize costs related to this revised requirement in the final regulatory assessment. *See* discussion *supra* Section 3.4 (Final Rule – New or Revised Requirements with Cost Impacts). In this light, discussion herein of qualitative benefits relating to this requirement would also be misplaced.

requirement. As discussed above, *see* discussion *supra* section 3.2, failure to announce stops and other identifying route information has been a recurring problem under the existing regulatory regime. By requiring audible and visible notification of upcoming stops and other identifying route information through automated announcements, the new requirement is expected to deliver significant benefits to passengers with vision- or hearing-related disabilities who use fixed-route buses and OTRBs, or would use such services absent communications barriers. Consistent and intelligible stop and route announcements, for example, may enable passengers who are blind or have low vision—for the first time—to use fixed-route service independently, or permit them to do so more reliably and with greater frequency. Automated announcements are also expected to generate time savings by lessening (if not preventing) situations in which passengers with vision- or hearing-related disabilities disembark at the wrong stop, and then must wait for another bus (or other means of transportation) to transport them to their desired destination. Alighting at the wrong stop may also present safety issues if the individual is not oriented to their surroundings or the stop is located in a hazardous area. In sum, the automated announcement systems requirement will not only deliver direct and substantial benefits to fixed-route passengers with vision- or hearing-related disabilities, but will also promote fairness by ensuring a more consistent approach to announcements on fixed-route vehicles across the country.

Individuals with other disabilities may also experience benefits from the automated announcement system requirement. Studies have shown that individuals with cognitive or intellectual disabilities also frequently face communications barriers when using fixed-route transit, and, thus will benefit from consistent, reliable stop and route announcements such as those provided by automated announcement systems.[58] Additionally, for individuals with significant mobility impairments, automated stop announcements may mean the difference between getting off at the correct stop and getting off at the wrong stop—due to unintelligible (or non-existent) stop or route announcements—to face a physically arduous or hazardous journey to his or her intended destination (or other location that gets the trip back on track).[59]

For the new OTRB-related requirements, benefits are expected to be similar to, though perhaps not as significant as, the benefits accruing from automated announcement systems. These four new accessibility requirements—identification of wheelchair spaces and priority seats, exterior destination/route signage, public address systems, and stop request systems—are all aimed at addressing communication barriers to use of, or use of accessible features on, OTRBs. With required signage of accessible onboard seating,

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[58] *See, e.g.*, NCD, *Current State of Transportation 2005*, *supra* note 10, at 13-14, 26; Arizona State Univ., Morrison Institute for Public Policy, *Stuck at Home: By-Passing Transportation Roadblocks to Community Mobility and Independence* 3 (2013).

[59] For example, a transit bus rider with mobility-related disabilities, recounted her difficulties when vehicle operators failed to announce stops, or when such announcements were unintelligible:

> I am living with MS [multiple sclerosis] and other congenital deformities …. It was really bad when stops were not being announced on our buses. Even when they were announced, depending on where you sat, it may be hard to hear the stop called out. I was taking night classes and had to get off at an unusual stop. I would miss the stop because I couldn't see it and the stop was not announced. So I had to get off at a later stop, which meant crossing one of the busiest intersections. For me, the less walking the better. By the time I got to class, I was late, angry, and [fatigued].

NCD, *Current State of Transportation 2005*, supra note 10, at 26.

persons with mobility impairments will be able to more readily locate required accessibility seating. Such signage may also deter passengers without disabilities from using priority seating or setting packages or strollers in wheelchair spaces, thereby ensuring their availability for passengers with disabilities. Similarly, requiring accessible stop request mechanisms within reach of priority seats and wheelchair spaces on OTRBs operating in fixed-route service ensures that passengers with disabilities who use such seating can independently indicate their desire to disembark at the next designated stop. Public address systems, in turn, enable passengers with hearing-related disabilities (as well as other passengers) to better understand information conveyed by the vehicle operator, which, in the event of an emergency, could be of urgent significance. Lastly, having exterior destination/route signage on both the front and boarding sides of an OTRB aids passengers with disabilities by making it easier to ascertain a given vehicle's route, destination, or identity. Having such signage in both locations is particularly important, for example, at transit hubs, bus terminals, areas where multiple vehicles are parked simultaneously, or other locations where traffic or terrain make circling to the front of the vehicle to view its destination/route sign difficult or hazardous.

Yet, while the foregoing benefits may be qualitatively described, several considerations defy formal quantification. As noted above, there are multiple factors—such as lack of reliable data concerning bus and OTRB ridership levels by persons with disabilities, as well as the current status of covered transit buses and OTRBs in terms of accessible features—that would preclude quantifying the pool of direct beneficiaries formally. Nonetheless, review of data on the prevalence of specific types of disabilities amongst the U.S. population still provides an informal sense of the relative magnitude of potential beneficiaries. Statistics on disability prevalence vary substantially depending on the data source, methodologies employed, survey population, and data definitions. For example, the U.S. Census Bureau and the Centers for Disease Control and Prevention (CDC) each publish statistical data relating to the prevalence of certain functional categories of disabilities in the U.S. population.[60] Appendix H presents data excerpted from the Census Bureau's 2010 "Survey of Income and Program Participation" (SIPP) and 2014 "American Community Survey" (ACS), as well as the CDC's 2013 "Behavioral Risk Factor Surveillance System." While these data sets all use somewhat different methodologies, as summarized in the appendix, each nonetheless breaks down its respective statistics into fairly similar functional disability categories.

In sum, comparison analysis of the Census Bureau and CDC data sets provides the following broad population ranges for individuals with disabilities, grouped by functional disability category, who may experience direct benefits from one or more new accessibility requirements in the final rule:

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[60] *See* Centers for Disease Control and Prevention, *Morbidity and Mortality Weekly Report*, "Prevalence of Disability and Disability Type among Adults – United States, 2013" (July 2015) (compiling data from the CDC's "Behavioral Risk Factor Surveillance System"); U.S. Census Bureau, American Community Survey, 2014 Data Release (2015), available at: https://www.census.gov/programs-surveys/acs/; U.S. Census Bureau, *Americans with Disabilities: 2010* (July 2012) (compiling data from the Census Bureau's "Survey of Income and Program Participation").

Table 11 – Estimated Population Ranges for Certain Functional Disability Categories among U.S. Non-Institutionalized Persons Derived from Census Bureau and CDC Disability Statistics

Functional Disability Category	Estimated Population Range (Non-Institutionalized, ≥ 15/18 yrs.)	Percent of U.S. Population (Non-Institutionalized, ≥ 15/18 yrs.)
Vision	6.8 million - 11.2 million	2.8% - 4.6%
Hearing	5.6 – 13.1 million	1.0% - 5.4%
Cognitive	2.2 million - 25.7 million	0.9% - 10.6%
Mobility	15.2 million - 31.5 million	2.2% - 13.0%

Again, not every (or even most) individuals with vision, hearing, cognitive, or mobility impairments will directly benefit from the final rule (or experience benefits in the same way), but such data nonetheless provide a starting point for a general understanding of the extreme upper-bound of the pool of potential beneficiaries.

Second, any estimate of quantified benefits would also need to scale the foregoing broad population figures by, at the very least, the likelihood that persons with disabilities will be using public transit buses and OTRBs, and, thereby, benefitting from accessibility improvements under the final rule. There are few known sources for such data, and, the sources that do exist, have significant limitations (e.g., insufficient level of detail, relatively small sample size, older study that may not reflect current ridership levels). Nonetheless, at the very least, these sources provide a rough sense of fixed-route ridership by persons with disabilities on public transit systems. (No data sources were located for statistics on ridership levels of persons with disabilities on privately-owned OTRBs.) For example, a 2013 study conducted by the Transportation Research Board of the National Academy of Science surveyed seven public transit agencies concerning ridership by persons with disabilities during the three-year period from 2009 to 2011 found that, on average, passengers with disabilities constituted 4.9% of total fixed-route ridership across all transit modes.[61] Additionally, a 2002 national transportation survey conducted by the Department of Transportation showed that, while the majority of all bus riders use public transit service two or fewer days per week for local travel regardless of disability status, riders with disabilities—on average—use public transit buses with slightly greater frequency per week (2.5 days) than nondisabled riders (1.93 days).[62] Several transportation-related research reports also observe that use of public transportation systems by passengers with disabilities—particularly, fixed-route transit—has risen steadily in recent years.[63] While these data sources are not sufficiently tailored to formally quantify

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[61] *See* TRB, TCRP Report 163, *supra* note 6, at 8-9 & tbl. 2-2 (calculated average from data provided in Table 2-2).

[62] Dept. of Transportation, Bureau of Transportation Statistics, 2002 National Transportation Availability and Use Survey, Tbl. 18 (2002), available at: http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/freedom_to_travel/html/table_18.html.

[63] *Id*.; *see also* NCD, *Transportation Update 2015*, *supra* note 10, at 22-24; TRB, TCRP Report 163, *supra* note 6, at 9 & tbl. 2-2; ASU, *Stuck at Home*, *supra* note 57, at 2 (noting that public transit ridership by persons with disabilities in Maricopa Country had increased in the past ten years, but still represented only .04% of total ridership); NCD, Current State of Transportation 2005, *supra* note 10, at 24.

benefits, they do provide a rough gauge of the current level of fixed-route public transit ridership by persons with disabilities.

Finally, it bears noting that other individuals and entities, including transit agencies, may also benefit indirectly from new accessibility requirements in the final rule. Several research studies on ITS deployments (including automated announcement systems) by transit agencies have shown that such systems often have the beneficial effect of increasing both customer satisfaction and ridership.[64] For transit agencies that do not yet have automated announcement systems, compliance costs incurred in deploying such systems might thus be offset in part by increases in fixed-route ridership and fare revenues. Additionally, nondisabled fixed-route bus riders who are unfamiliar with a particular route, or who may be visiting from outside the area, may find the wayfinding assistance provided by automated stop and route announcements to be helpful.

6.2. Threshold Analyses – Automated Announcement Systems

While the significant benefits that persons with disabilities and others will derive from the new and revised accessibility requirements in the final rule are believed to be quite weighty, formal monetization of these benefits is beyond the scope of this Final RA for the reasons discussed above. Nonetheless, to impart a rough sense of the magnitude of these benefits in relation to costs, the Access Board conducted two threshold (breakeven) analyses to demonstrate that benefits accruing from one of the key accessibility enhancements in the final rule – namely, the new requirement for automated announcement systems on large, fixed-route buses operated by large transit entities – need only be quite modest in order for their monetary value to break even with monetized costs. (Threshold analyses could not be conducted for the new OTRB-related accessibility requirements due to the unavailability of data concerning ridership by persons with disabilities.)[65] Discussion of these two threshold analyses follows below. Additionally, a detailed discussion of the methodology and data sources underlying these analyses is provided in Appendix I.

The first threshold analysis explores the breakeven point between monetized costs for the automated announcement system requirement and the value of its benefits to persons with disabilities. In sum, this analysis looks at annualized costs relative to expected annual fixed-route bus ridership by persons with disabilities in the geographical areas served by large transit entities (which are the only transit agencies subject to the automated announcement system requirement). In this context, it is estimated that persons with disabilities in the relevant geographical areas would have to place only a small monetary value on riding a fixed-route bus equipped with an automated stop and route announcement system for the costs and benefits of this requirement to be equal. More specifically, it is assumed that annualized costs for automated announcement systems will be $3.61 million (which represents estimated costs under the primary scenario at a 7% discount rate) and that passengers with disabilities in the relevant geographical areas will take approximately 4.1 million trips annually on automated announcement system-equipped

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[64] *See, e.g.*, Transportation Research Board, *TCRP Synthesis 73 – AVL System for Bus Transit: Update* 3, 64-66 (2008); Delaware Center for Transportation, University of Delaware, *Costs and Benefits of Advanced Public Transportation Systems at Dart First State* 23-32 (July 2004).

[65] Specifically, despite extensive research, the Access Board found no published reports, statistics, or other quantitative metrics relating to the number of passengers with disabilities who use OTRBs operated by charter buses, long distance bus companies, or other private firms offering OTRBB-related transportation services.

fixed-route buses operated by large transit entities. *See* Appendix I (discussing estimation of these cost and bus ridership figures). Dividing the $3.61 annualized cost by the 4.1 million annual uses (as measured by fixed-route bus trips taken by passengers with disabilities), shows that, for costs and benefits to break even, bus passengers with disabilities need only value the safety, independence, and equity and other benefits of automated announcement systems at about .88¢ per trip. The Access Board believes, based on its experience, that .88¢ underestimates (and likely substantially so) the value that passengers with disabilities would place on these benefits in this transportation context.

The second threshold analysis assesses the cost:benefit breakeven point for the automated announcement system requirement in terms of increased ridership of more accessible fixed-route buses (*i.e.*, buses equipped with automated announcement systems) by persons with disabilities who formerly used paratransit for some or all of their transportation needs. This second analysis is based on transportation surveys and reports showing that, among persons with disabilities who currently use paratransit systems, there is strong interest in using fixed-route transit service – which is more integrated (and thus is often viewed as less stigmatizing) and generally has a more reliable, fixed schedule – absent various accessibility barriers, including problems with stop and route announcements.[66] Because operating costs for paratransit services greatly exceed those for fixed-route buses, a demand shift from paratransit to fixed-route buses would result in cost savings in operational expenses for transit agencies. To be sure, as noted above, the extent to which the automated announcement system requirement will spur demand for fixed-route bus transit among current paratransit riders is not presently known. However, the value of this second threshold analysis is that it does not require quantification of the demand shifts from paratransit to fixed-route buses that can be fairly attributed to the automated announcement system requirement. Instead, this threshold analysis merely aims to quantify the shift in ridership from paratransit to fixed-route bus transit that would be needed for monetized costs of the automated announcement system requirement to break even with benefits, which, in this case, are monetized in terms of cost savings to transit agencies from reductions in paratransit operating expenses.

For purposes of the second threshold analysis, costs and benefits are monetized as follows. Annualized costs for automated announcement systems are again assumed to be $3.61 million (i.e., annualized costs under primary scenario at 7% discount rate). On the benefits side of the calculus, it is assumed that paratransit operating costs are $40.00 per trip (which represents a mid-point estimate among the largest providers of paratransit services), and that a paratransit user takes 8 trips weekly for various purposes (*e.g.*, commuting, visiting family, socializing, medical appointments) for an annual total of 400 paratransit trips (8 x 50 weeks, with two weeks of assumed vacation time). *See* Appendix I. Based on these assumptions, estimated annual paratransit operating expenses are $16,000 per person. Dividing $3.61 million (annualized costs for automated announcement system by $16,000 (annual per passenger operating expenses for paratransit services), shows that, for costs and benefits to break even, about 225 current paratransit users in areas served by large transit entities would need to switch to fixed-route transit buses. To put this figure in perspective, it is estimated that about 21.5 million persons with disabilities live in the geographical areas served by large transit entities subject to the automated announcement system requirement. Should actual paratransit trip operating costs or usage differ from the assumptions

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[66] *See, e.g.,* TRB, *TCRP Report 163*, *supra* note 6, at Chapter 2.2; *see also National Council on Disability, Transportation Update: Where We've Gone and What We've Learned* 39 (2015) (discussing the importance of effective stop announcements to persons with disabilities, and noting that "lack of an effective stop announcement and route identification program can force riders onto ADA paratransit").

used in this threshold analysis, the breakeven point may differ from the above, but the principle remains the same.

Based on the foregoing, the Access Board believes that benefits from the final rule, were they amenable to full quantification and monetization, would exceed the relatively modest economic (cost) impact of this rule.

7. COSTS: RESULTS & DISCUSSION

7.1. Summary of Results

The Final RA assesses the economic impact of the revised transportation vehicle accessibility guidelines in the final rule from several cost perspectives. First, for each year of the expected 12-year term of the final rule, the Final RA estimates annual costs collectively for all requirements under the three respective cost scenarios (i.e., "low," "primary," and "high" assumptions). Additionally, in order to afford a more complete understanding of annual costs related to the final rule, the Final RA also examines per-agency costs for the automated announcement systems requirement, and presents several "stress tests" to assess the relative impact of revising selected cost-related assumptions on overall results. Based on the results of the foregoing cost analyses, the Access Board concludes that the final rule does not represent a "significant" regulatory action under Exec. Order 12,866 §§ 3(f)(1), 6(a)(3)(C) (Oct. 4, 1993). Second, the Final RA also includes a separate "threshold" small business analysis to assess whether annual costs of the final rule will likely have a "significant" economic impact on "small businesses" in the OTRB industry—namely, scheduled intra- and inter-city transportation services, charter services, and scenic/sightseeing services. The results of this small business analysis show that, while the final rule will undoubtedly affect a "substantial" number of small OTRB firms given that small firms predominate in these industry sectors, its economic impact will not be "significant" within the meaning of the RFA. *See* 5 U.S.C. § 604(a).

7.1.1. Annualized Costs of New Requirements

The annualized compliance cost for new or revised accessibility requirements in the final rule over the studied 12-year regulatory horizon are estimated to range from $2.6 million to $7.9 million when using a 3% discount rate, and from $2.3 million to $7.2 million when using a 7% discount rate. Table 12 below shows the annualized cost of new requirements in the final rule under each L-M-H scenario at 3% and 7% discount rates.

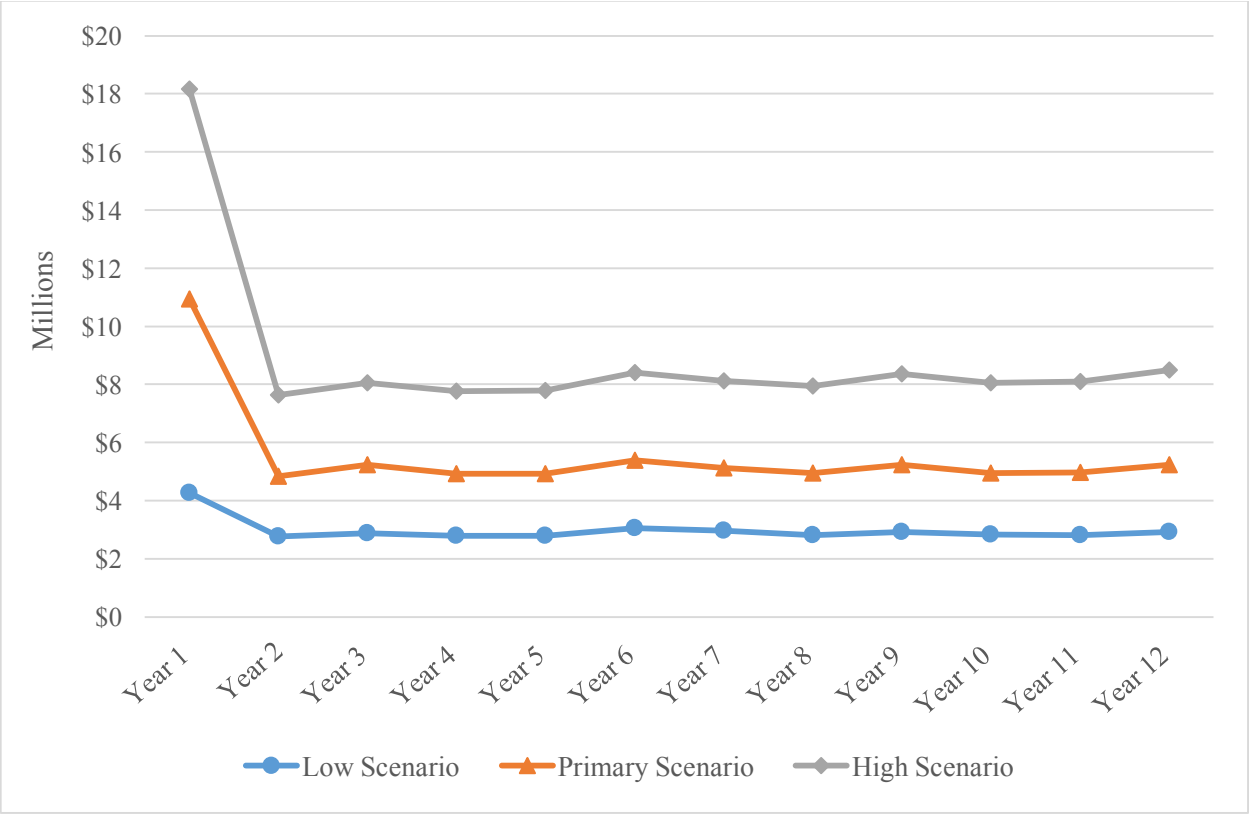
Table 12 Annualized Cost of Revised Accessibility Guidelines for Buses, Vans, and OTRBs, All Regulatory Years (3% and 7% Discount Rates)

Discount Rate	Low Scenario ($millions)	Primary Scenario ($millions)	High Scenario ($millions)
3%	$2.6	$4.9	$7.9
7%	$2.3	$4.5	$7.2

The Final RA also shows that estimated annual costs for the final rule will be substantially below $100 million for each regulatory year under all three cost scenarios, which is the threshold value for

economic significance of regulatory action under Executive Order 12,866. Annual costs for each year during the expected 12-year term of the final rule are depicted in Figure 1 below.[67]

Figure 1 - Annual Costs of Final Revised Accessibility Guidelines for Buses, Vans, and OTRBs (Nominal Dollars)

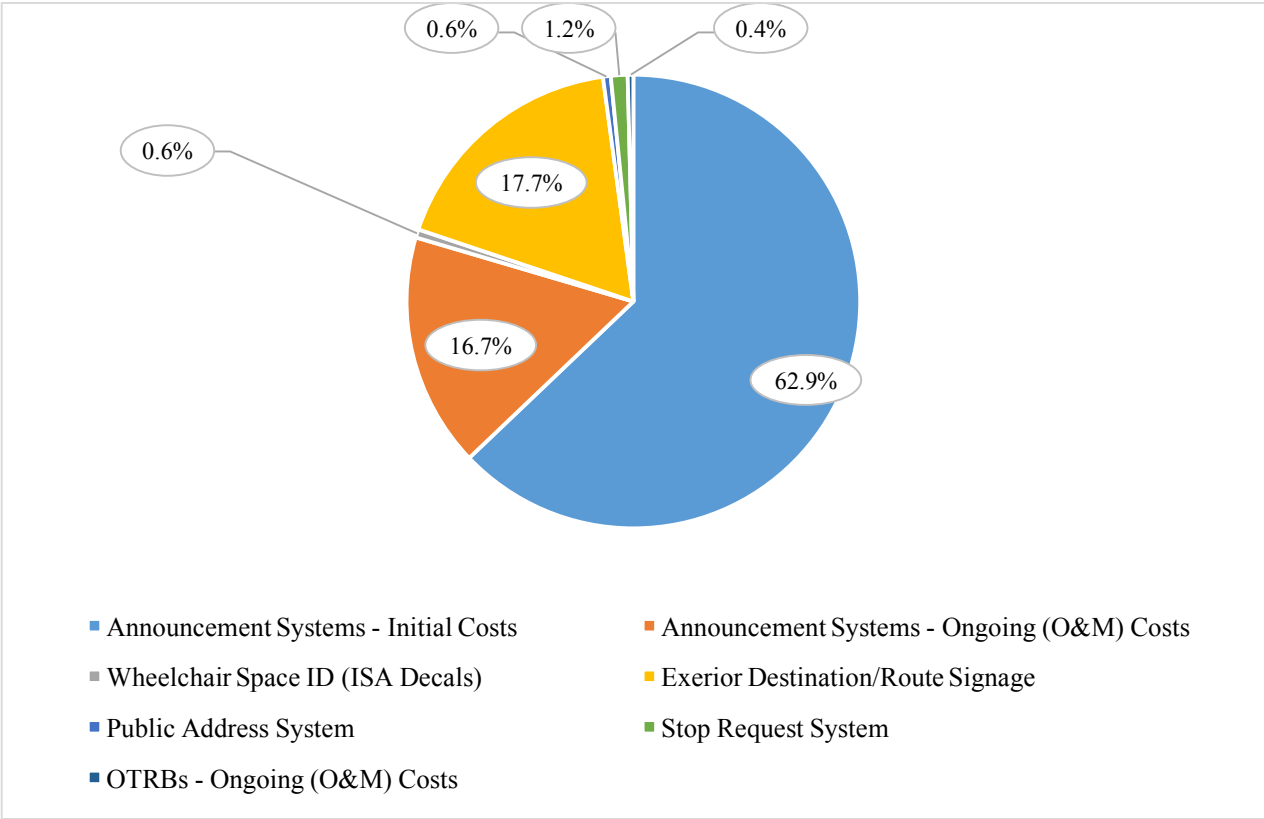


As shown above, the highest single-year costs occur in Year 1, which is due to anticipated initial costs for large transit agencies that currently do not have (nor have firm plans to acquire) automated announcement systems to come into compliance by developing stop and announcement databases, purchasing and installing other backend hardware and software, equipping new fixed-route buses with onboard equipment, and training agency personnel. Thereafter, for Year 2 to Year 12, costs remain relatively constant as initial announcement systems-related costs approach zero (with the exception of the one "new" large transit agency crossing the VOMS 100 threshold every third year) and ongoing operation and maintenance costs come to the fore. Costs related to the four new OTRB accessibility requirements, on the other hand, remain relatively constant over the 12 years, with exterior destination/route signage representing the highest-cost OTRB requirement, though still significantly lower than expected initial costs for automated announcement systems.

[67] In addition, as noted below, Appendices E and F present detailed breakdowns of annual compliance costs under each scenario for the automated announcement systems requirement (applicable only to large transit agencies) and for the new OTRB accessibility requirements.

A break-out of costs by category of requirement relative to total costs is presented in Figure 2 below. This figure illustrates that initial (one-time) costs related to the requirement for automated announcement systems are, by far, the most significant cost item, representing about 63% of the overall cost of the final rule. Thereafter, in terms of relative size, costs for exterior destination/route signage (17.7%) are the second-largest cost item, followed closely by ongoing (O&M) costs for announcement systems (16.7%).

Figure 2 - Total Costs by Category of Accessibility Requirement (Nominal Dollars)



7.1.2. Annualized Costs for Automated Announcement Systems under Primary Scenario by Transit Agency Category (Tiers I, II & III)

In addition to evaluating total costs of the final rule, the Final RA also examines likely annualized costs to each of the three categories of large transit agencies—Tiers I, II & III—under the requirement for automated announcement systems. Estimated costs for announcement systems are calculated, by transit agency tier, for each year over the projected 12-year term of the final rule. Results are broken down separately (in nominal dollars) for several announcement systems-related cost categories (e.g., one-time costs for bus equipment and backend systems, training costs, O&M costs), and then presented as rolled-up annual cost totals at 3% and 7% discount rates and as annualized values. Complete results for these cost analyses are provided in Appendices E-1 to E-3.

Presented in Table 13 below, in sum, are per-agency annualized costs for the automated announcement systems requirement under each L-M-H cost scenario. These annualized costs range

from about $44,000 (for a Tier I agency under the low scenario) to about $430,000 (for a Tier III agency under the high scenario). Under the primary scenario, which models what are considered to be the most likely set of cost assumptions, per-agency costs for announcement systems are estimated to be as follows: Tier I - $80,659; Tier II - $154,985; and, Tier III: $264,968.

Table 13 - Annualized Costs of Automated Announcement Systems Requirement for Large Transit Agencies (Tiers I, II & III)

	Low Scenario	Primary Scenario	High Scenario
Large Transit Agency - Tier I	$44,208	$80,659	$129,305
Large Transit Agency - Tier II	$76,678	$154,985	$248,313
Large Transit Agency - Tier III	$129,444	$264,968	$429,715

Not surprisingly, the foregoing annualized cost figures underscore the logical cost corollary that per-agency costs directly relate to agency size, with the "smallest" large transit agencies (Tier I) experiencing the lowest annualized costs under all scenarios, and, conversely, the "largest" large transit agencies (Tier III) having the highest annualized costs. Nonetheless, even for Tier III agencies, costs are not estimated to exceed $450,000 annually under even the high scenario.

7.1.3. Annual Costs for New OTRB Accessibility Requirements

Unlike the automated announcement systems requirement, the new OTRB accessibility requirements do not affect a discrete set of entities. As noted previously, there are various transportation-related industry sectors that use OTRBs for scheduled services, charter services, sightseeing, and other services. *See* discussion *supra* section 4.3. Consequently, it is not possible to reliably estimate costs related to the new OTRB accessibility requirements on a per-firm basis. Thus, in terms of analyses focusing specifically on these new requirements, the Final RA examines costs on a per-vehicle and per-requirement basis.

First, the Final RA evaluates costs under the four new OTRB accessibility requirements are calculated, by requirement, for each year over the projected 12-year term of the final rule. Results are broken down separately (in nominal dollars) for each requirement, and then presented as rolled-up totals in nominal dollars, at 3% and 7% discount rates, and in annualized values. Complete results for these cost analyses are provided in Appendices F-1 to F-3.

Second, the Final RA assesses the costs related to the four new OTRB accessibility requirements from a per-vehicle perspective. Annualized costs of these new OTRB requirements are examined under each L-M-H scenario, with results presented at both 3% and $7 discount rates. The results are shown in Table 14 below.

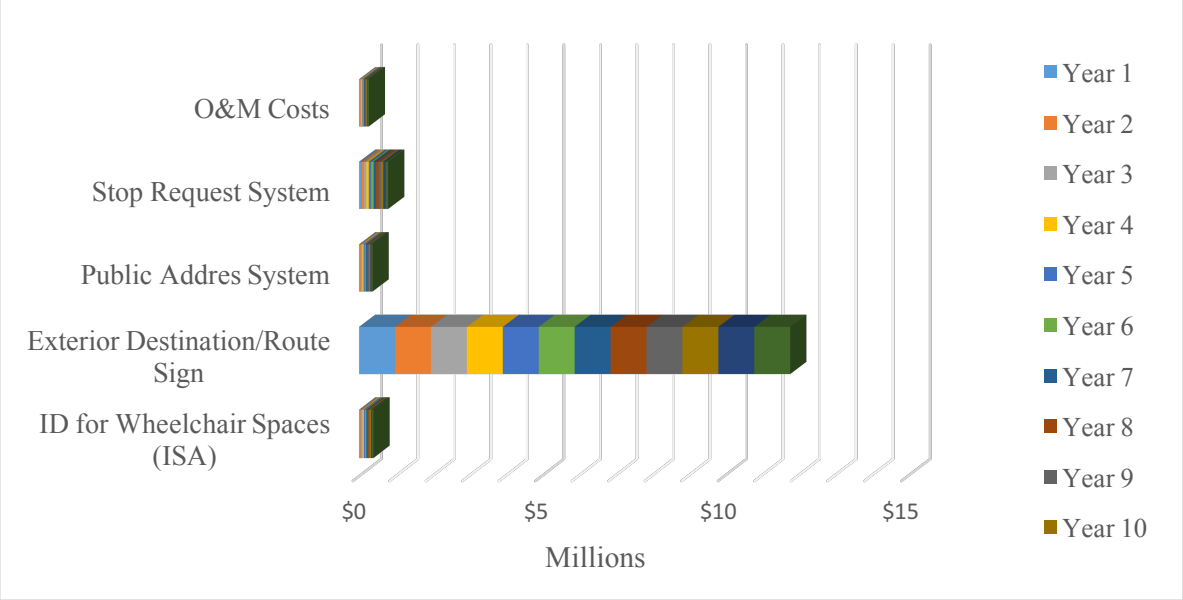
Table 14 – Per-Vehicle Annualized Costs of New OTRB Accessibility Requirements

	Low Scenario	Primary Scenario	High Scenario
3% Discount Rate	$631	$1,124	$1,754
7% Discount Rate	$549	$971	$1,513

As this table demonstrates, the cost of the new OTRB accessibility requirements are expected to be relatively modest under all three cost scenarios. Indeed, annualized costs per vehicle are not expected to exceed about $1,750 under even the high scenario.

Lastly, to provide a sense of the relative cost impact of each of the four new OTRB accessibility requirements, the Final RA explores annual costs for each requirement separately. This breakdown of annual cost is presented in Figure 3 below.

Figure 3 - Breakdown of Total Annual Costs of New OTRBs Accessibility Requirements under Primary Scenario (in Nominal Dollars), by Regulatory Year



This figure clearly shows that the requirement for exterior destination/route signage is expected, relatively speaking, to have the highest cost among these four OTRB requirements.

7.2. Additional Cost Studies: Stress Tests for Selected Assumptions

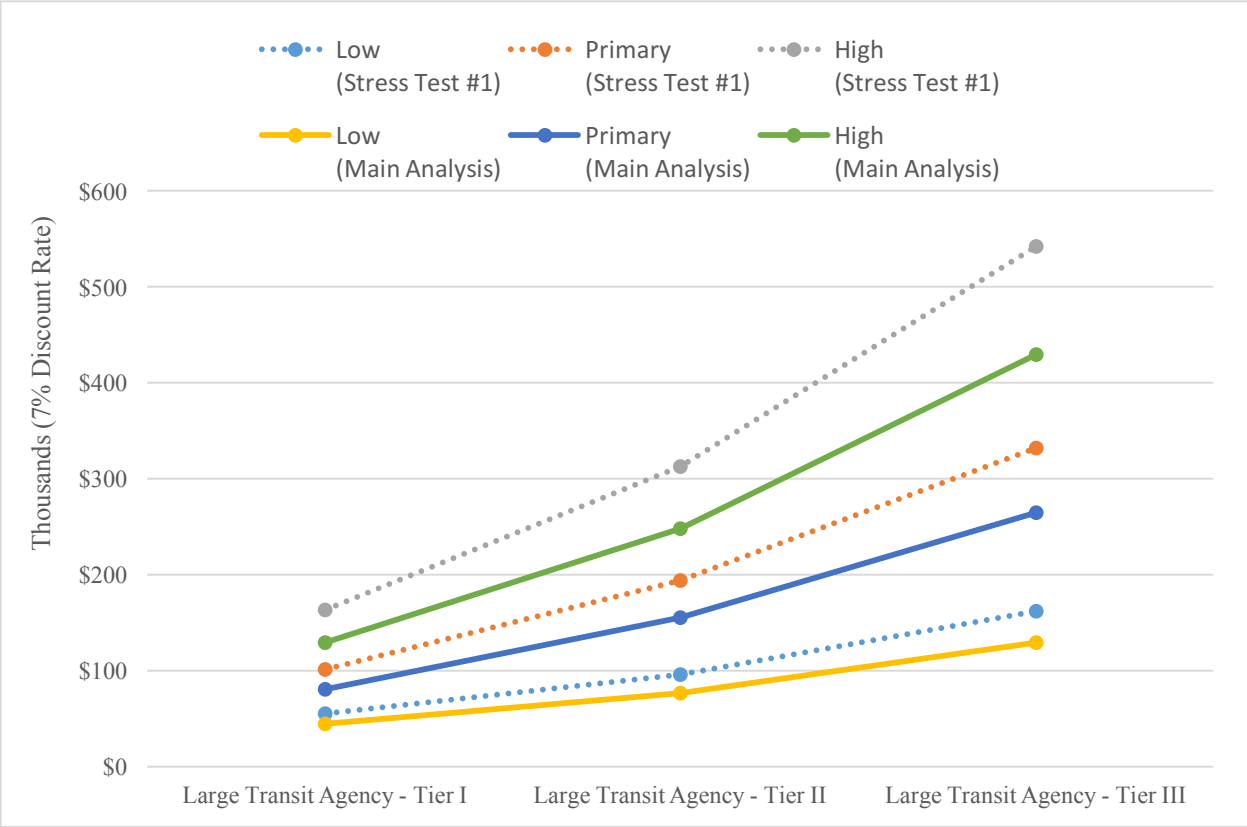
In addition to the foregoing annual (and annualized) cost studies—which examine the range of costs of the final rule in light of the estimated likely values for all cost-related assumptions—the Final RA also includes four other limited assessments in order to explore the relative impact of modifying certain cost-related parameters. These analyses are intended to evaluate changes in costs from alternate assumptions.

These changes are not intended to model realistic values for these four cost parameters. Rather, these studies are intended to serve as "stress analyses" to examine how results would be impacted by a "hypothetical" adjustment in a cost parameter. The four "stress tests" separately examine the impact of adjustments to the cost model by substantially increasing one of four key cost parameters—two related to cost calculations for the automated announcement systems requirement, and two related to the cost calculus for the new OTRB accessibility requirements.

7.2.1. Unit Costs for Automated Announcement Systems

The first stress test assesses the impact of substantial increases in unit costs for automated announcement systems. Specifically, all unit cost values used in the cost model calculate costs for this this requirement (with the exception of hourly or annual wage rates for transit agency employees)—including one-time costs for onboard equipment and backend systems, annual operation and maintenance expenses, and mid-life software upgrades—were inflated by 25%. The results from this first stress test are presented below in Figure 4.

Figure 4 - Impact of Increase in Unit Costs of Automated Announcement Systems Requirement on Per-Agency Annualized Costs (Stress Test #1)



As demonstrated by the figure above, a 25% increase in unit costs for automated announcement systems would result, not surprisingly, in a concomitant rise in overall costs for this requirement under each L-M-H scenario. This inflationary effect on overall results, however, does not fall equally, in a relative sense,

across the three cost scenarios. Rather, the low scenario experiences the smallest differential as between results from the stress test and "main" analysis, while the high scenario exhibits the largest differential. This stress test demonstrates that, because initial costs for deployment of automated announcement represent the largest component of their total (lifecycle) costs, the largest transit agencies (Tier III) would be most affected by increases in unit costs for automated announcement systems.

7.2.2. Number of Large Transit Agencies Likely to Incur Costs under Automated Announcement Systems Requirement

The second stress test evaluates the impact of a hypothetical, significant increase in the number of large transit agencies at "Year 1" that do not already have automated announcement systems (or firm plans for such systems) and, thereby, incur compliance costs under the automated announcement system requirement. In this test, the number of affected transit agencies was inflated by 25%. The net effect of this increase is, with respect to the number of large transit agencies that incur compliance costs under the announcement systems requirement, to add two additional agencies per agency category (i.e., Tiers I, II & III) relative to the main analysis.[68]

The impact on overall costs from this second stress test are shown below in Table 15, which presents the increase in annualized costs of the final rule from the stress test relative to the main analysis.

Table 15 - Impact of Increase in Number of Large Transit Agencies Expected to Incur Compliance Costs under Automated Announcement Systems Requirement on Annualized Costs of Final Rule

Discount Rate	Low Estimate ($millions)	Primary Estimate ($millions)	High Estimate ($millions)
3%	$0.6	$1.1	$1.8
7%	$0.5	$1.0	$1.6

In sum, this stress test shows that increasing the number of large transit agencies incurring compliance costs under the requirement for automated announcement systems raises annualized costs by about $500,000 under each L-M-H scenario at both 3% and 7% discount rates.

7.2.3. Percentage of OTRBs Operating in Fixed Route Service

Turning to the OTRB-related requirements, the third stress test examines the impact of a significant increase in the percentage of OTRBs assumed to be operating in fixed route service. This proportional change affects the number of OTRBs potentially incurring costs under the requirements for public address systems, stop request systems, and priority seat signage since these requirements are limited to large vehicles in fixed-route service. For this stress test, 50% of the total OTRB fleet was assumed to be

[68] For example, under the main analysis, nine Tier I transit agencies are assumed to incur compliance costs under the automated announcement systems requirement, whereas, under the stress test, eleven such agencies (9 x .25) incur such compliance costs.

operating in fixed route service and thereby subject to these three requirements, which represents a 20% relative to the "regular" cost model. The results from this third stress test are provided in Table 16 below.

Table 16 - Impact of Increase in Assumed Proportion of OTRBs Used in Fixed Route Service on Per-Vehicle Annualized Costs

	Low Scenario	Med Scenario	High Scenario
3% Discount Rate	$49	$97	$159
7% Discount Rate	$43	$84	$137

As this table demonstrates, annualized costs per vehicle are only modestly sensitive to a substantial increase in the proportion of the total OTRB fleet assumed to be operating in fixed-route service. Under the high scenario, for example, annualized costs under the stress test rise by less than $160 per vehicle. This is likely due to two considerations. First, the three affected requirements (i.e., public address systems, stop request systems, and priority seating signage) are not typically high-cost items, so that even a several-fold increase in the number of affected vehicles does not have a significant impact on costs overall. Second, even though this stress test increases the number of OTRBs incurring compliance costs under these requirements, this still represents only a portion of the total OTRB fleet nationally, thereby muting the impact of such a change on per vehicle annualized costs.

7.2.4. Likelihoods of Changes that Incur OTRB Compliance Costs

The fourth—and final—stress test explores the impact of a hypothetical across-the-board increase in the likelihoods that OTRBs will incur compliance costs related to the new OTRB accessibility requirements. Specifically, this stress test assumes a 50% greater likelihood that an OTRB would not, based on current industry practice or assumed mode of operation, have the accessibility features required by the final rule and, thereby, incur compliance costs. Only costs related to the requirements for priority seating signs, exterior destination/route signs, public address systems, and stop request systems are affected by this hypothetical increase in likelihoods. (The cost model already conservatively assumes that all OTRBs will incur compliance costs to identify wheelchair spaces and accessible doorways with the International Symbol of Accessibility (*i.e.*, 100% likelihood). *See* Appendix D.) The results from the fourth stress test are provided in Table 17 below.

Table 17 - Impact of Increase in Likelihoods that OTRBs Will Incur Compliance Costs under New Accessibility Requirements on Per-Vehicle Annualized Costs

	Low Scenario	Primary Scenario	High Scenario
3% Discount Rate	$693	$833	$920
7% Discount Rate	$603	$720	$792

As this table shows, an across-the-board 50% increase in likelihoods has a sizeable impact on costs, with overall per-vehicle annualized costs rising about $700 (low scenario/3% discount rate) to just under $1,000 (high scenario/7% discount rate) depending on the scenario and discount rate. This increase in likelihoods, moreover, had significantly greater cost impact on per-vehicle annualized costs as compared to third stress test, which evaluated the impact of a higher proportion of OTRBs operating in fixed route service. This is largely due to the fact that this fourth stress test explores the impact of increasing a cost factor (*i.e*., likelihood of incurring costs) that applies to all OTRBs, whereas the third stress test involves one cost factor (*i.e*., type of service) that affects only a portion of the total U.S. fleet of OTRBs. Nevertheless, this fourth stress test serves to underscore the significant role likelihoods play in the calculation of costs for OTRB-related accessibility requirements.

8. ALTERNATIVE REGULATORY APPROACHES: LARGE TRANSIT AGENCIES AND THE VOMS 100 THRESHOLD

While other sections of this regulatory assessment evaluate the likely incremental costs and benefits of new or revised accessibility requirements in the final rule, this section aims to explore one specific requirement from a slightly different perspective – namely, some of the primary quantitative factors supporting promulgation of a VOMS 100 threshold for large transit agencies (which are the only transit agencies subject to the automated announcement systems requirement) in lieu of other potential VOMS thresholds. As discussed more fully in the preamble to the final rule, establishment of a 100-bus VOMS threshold for large transit agencies, in the Access Board's view, strikes a reasonable balance between competing interests (*e.g.*, improved communication accessibility versus not overburdening smaller transit agencies). *See* Preamble to Final Rule – Americans with Disabilities Act Transportation Vehicle Guidelines, Section III (Major Issues – Automated Stop Announcements). This section explores some of the quantitative considerations underlying the agency's establishment of a VOMS 100 threshold for large transit agencies, as opposed to other potential numeric thresholds.

As an initial matter, it bears noting that the scope of the automated announcement requirement has narrowed since it was first proposed by the Access Board in 2007. As discussed in the preamble to the final rule, under the Board's 2007 draft revisions to the existing vehicle accessibility guidelines, all transit agencies - regardless of size - would have been required to outfit their large, fixed-route buses with automated stop and route announcement systems. *Id*. at Sections II (Regulatory History) & III (Major Issues – Automated Stop Announcements). Several commenters responded by urging the agency to add a "small fleet exemption" to the automated announcement systems requirement because, in their view, smaller agencies often lack the financial resources or technical knowledge needed to acquire and implement such systems. *Id*. at Section II (Regulatory History). To address these concerns, when the Access Board published a second set of draft revisions to the existing vehicle guidelines the following year (2008), application of the automated announcement systems requirement was limited to larger transit agencies that operated 100 or more buses in annual maximum service (VOMS). *Id*. In establishing a VOMS 100 threshold for transit agencies subject to the automated announcement systems requirement, the Access Board's primary aims were to limit coverage to larger transit entities that were most likely to (i) have the financial and technological resources to deploy automated announcement system functionality, and (ii) serve a significant population of persons with disabilities. *Id*. at Sections II (Regulatory History) & III (Major Issues – Automated Stop Announcements). The proposal in the 2008 draft revised vehicle accessibility guidelines for inclusion of a VOMS 100 threshold in the automated announcement systems requirement received no negative comments. *Id*. at Section II (Regulatory History). The VOMS 100 threshold was thus carried forward with only minor (non-substantive) changes to the 2010 NPRM (where it also received no negative comments), and, subsequently, to the final rule. *Id*.

Inclusion of a VOMS 100 threshold in the final rule, while not solely data-driven, was nonetheless backed by several quantitative considerations that pointed to this numeric threshold as an appropriate and reasonable metric by which to classify large transit agencies. Comparison between

and among transit agencies of various sizes was facilitated by data from the National Transportation Database (NTD), which provides a wealth of information on public transit entities operating in urbanized areas (UZAs)[69], including geographic, modal, operational, and financial information.[70] Though the NTD provides a significant amount of data, it does not, however, capture information specific to persons with disabilities, such as transit ridership or population within particular geographic areas. Consequently, to develop per-agency estimates of bus ridership by disabled passengers and the population of persons with disabilities within particular service areas, the Access Board looked to two other federal data sources for UZA-based statistics on individuals with disabilities (Census Bureau) and survey data on bus ridership by persons with disabilities (DOT/TCRP), which, when combined with NTD data, produced estimated population and ridership figures. *See* FRIA, App. J, p. J-28 (summary key describing data sources and methodologies used to calculate estimated service area population and bus ridership figures presented in Appendix J).

Taken together, these data enabled the Access Board to "build" a database with information on urban transit agencies of all sizes that operate fixed-route buses in the United States and its territories. In sum, this dataset permitted the Board to not only paint a quantitative portrait of each of the 681 urban transit agencies operating one or more bus modes according to 2014 NTD data, but also evaluate how drawing different numeric lines for the VOMS threshold might impact transit agencies of various sizes. A complete list of all 681 urban transit agencies that reported operation of one or more fixed-route buses in annual maximum service in 2014, along with some of their key characteristics, is provided in Appendix J. *See also* Tables 18 & 19, infra. Information presented in Appendix J includes data taken directly from 2014 NTD annual data (*e.g.*, primary UZA, bus VOMS, total federal capital funds), as well as estimated figures related to persons with disabilities (*i.e.*, population of persons with disabilities per service area, number of unlinked passenger trips by persons with disabilities for all fixed-route bus modes). *See* App. J, p. J-28 (key summarizing data sources and methodologies for data presented in Appendix J).

Based on this dataset, the Access Board conducted comparative analyses of alternate thresholds for large transit agencies that potentially could have been used (from a quantitative perspective) in the final rule, with particular emphasis on 50- and 250-bus VOMS levels as potential alternate regulatory approaches. The 50- and 250- bus VOMS levels were selected for analysis because they (i) represent

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[69] The Census Bureau, which has responsibility for designating UZAs, considers any densely populated area with 50,000 or more inhabitants to be an urbanized area. *See, e.g.*, FTA, *2014 Reporting Year – NTD National Transit Summary & Trends* 4 (Feb. 2015) (discussing UZAs in context of NTD data) (hereafter, "*2014 National Transit Summary & Trends*"), available at: https://www.transit.dot.gov/ntd/2014-ntst-storylines. UZA designations are based on decennial census data. According to 2010 Census data, there are just under 500 UZAs collectively in the United States and its territories. *Id*.

[70] For example, for urban transit providers, NTD data includes: number, type, and age of transit vehicles operated by mode of service; service area population; primary UZA designation; capital and operating expenses; revenue and funding sources; number of passenger trips (and miles) by mode of service; employee work hours and counts; and statistics on transit stations and maintenance facilities. *See, e.g.*, FTA, *2014 Reporting Year – NTD Policy Manual* (Feb. 2015), available at: https://www.transit.dot.gov/ntd/2014-ntd-policy-manual.

VOMS levels above and below the VOMS 100 threshold used in the final rule, and (ii) replicate break-points in the VOMS-level groups used by FTA to report NTD annual data.[71]

Summarized below are the results from comparative analysis of these three VOMS thresholds – VOMS 50, VOMS 100 and VOMS 250 – from several perspectives, including covered transit agencies' projected service area populations of persons with disabilities, bus ridership by disabled passengers, and availability of federal funds for ADA-related capital expenditures (such as deployment of automated announcement systems). All of the results discussed below are based directly on, or are derived from, the dataset presented in Appendix J – namely, the 681 urban transit agencies reporting one or more buses operated in annual maximum service based on 2014 NTD annual data.

First, with respect to service area populations and bus ridership by persons with disabilities, estimates for the VOMS 100 threshold fall between those for the alternative VOMS 50 and VOMS 250 thresholds. Estimated service area population and bus ridership by persons with disabilities (denoted using "PWD" in the table below) for each of the three studied VOMS levels are as follows:

Table 18: Comparison of Estimated Service Area Populations and Bus Ridership by Persons with Disabilities Using Three Different VOMS Thresholds (Based on 2014 NTD Annual Data)

VOMS Threshold (all Bus Modes)	# Transit Agencies (per VOMS Threshold)	Service Area Population - PWD (Estimated)*	% Total SA Pop./PWD	Unlinked Passenger Trips - PWD (Estimated)*	% Total UPT/PWD
VOMS 250	47	14,388,634	32.4%	192,902,910	74.5%
VOMS 100	99	21,400,372	48.2%	221,355,379	85.5%
VOMS 50	170	27,971,416	63.0%	237,504,055	91.8%
All Transit Agencies (Totals) =	**681**	**44,404,008**	**100.0%**	**258,796,035**	**100.0%**

On close review, however, the data in Table 18 provide some illuminating results. Notably, the VOMS 100 threshold encompasses service areas with a total population of persons with disabilities that is about 49% greater than the total population served by an alternate VOMS 250 threshold (*i.e.*, 21.4 million vs.14.4 million). Additionally, in terms of projected bus ridership by persons with disabilities, the VOMS 100 threshold is expected to generate about 15% more annual trips by passengers with disabilities on covered buses than would a VOMS 250 threshold (*i.e.*, 221.4 million vs. 192.9 million). Conversely, an

[71] *See, e.g.*, FTA, 2014 NTD Annual Summary – Tables 3 (Federal Government Sources for Transit Operating Funds Applied) & 7 (Transit Capital Funds Applied – Summary and Federal Sources), available at: https://https://www.transit.dot.gov/ntd/ntd-data. The eight VOMS-level groups used by FTA in its annual NTD data summary tables are: "1000 & Over," "500 – 999," "250 – 499," "100 – 249," "50 – 99," "25 – 49," "10 – 24," and "Under 10." *Id*.

alternate VOMS 50 threshold – because it covers significantly more transit agencies – would be expected to have higher service areas populations and bus ridership levels by passengers with disabilities than the VOMS 100 threshold; however, the relative differences between these two thresholds in service area population and bus ridership would be smaller than the VOMS 100/VOMS 250 differential. Taken together, these results lead to the conclusion that the VOMS 100 threshold is superior to an alternative, higher (VOMS 250) threshold in terms of maximizing potential beneficiaries (*i.e.*, individuals with disabilities who live in areas served by covered transit agencies and disabled bus passengers), while a lower VOMS threshold (VOMS 50) would produce only marginal increases in total service area population and bus ridership by individuals with disabilities.

Second, in terms of geographical coverage, each of the three studied VOMS thresholds would cover transit agencies nationwide, though such coverage would also vary in distinctive ways. An alternate VOMS 250 threshold would predominantly cover only transit agencies situated in America's largest metropolitan areas with several million residents – such as New York, Los Angeles, Miami, Philadelphia, Boston, Chicago, Dallas, and Phoenix. *See* Appendix J, pp. J-1 to J-3. The VOMS 100 threshold, in turn, encompasses transit agencies located in both large and medium-sized UZAs nationwide. *See id*. at pp. J-1 to J-6. Lastly, the alternate VOMS 50 threshold would embrace the widest size range of UZAs, from the largest metro areas to relatively smaller urban areas with only several thousand residents. *See id*. at pp. J-1 to J-9.

Based on this geographical data, the VOMS 100 threshold can be viewed as striking a middle ground in terms of scope of covered urban areas. First, relative to an alternate VOMS 250 threshold, the VOMS 100 threshold covers transit agencies across a significantly broader range of urban areas, from both geographical and demographic perspectives. For example, based on 2014 NTD data, a VOMS 100 threshold encompasses transit agencies in 64 different UZAs across the country, whereas a VOMS 250 threshold would cover transit agencies only in 33 different UZAs. *See id*. at pp. J-1 to J-6. Noticeably absent from coverage under a VOMS 250 threshold would be large and medium-sized UZAs throughout the country, including: Detroit, MI; Virginia Beach, VA; Rochester, NY; Hartford, CT; Tucson, AZ; Tampa-St. Petersburg, FL; Louisville/Jefferson County, KY-IN; Riverside-San Bernardino, CA; Kansas City, MO-KS; Indianapolis, IN; Providence, RI-MA; Memphis, TN-MS-AR; and Salt Lake City-West Valley City, UT. *Id*. A VOMS 250 threshold would thus leave millions of persons with disabilities in metro areas nationwide potentially without access to automatic announcement-equipped fixed-route transit buses. Second, unlike the alternate VOMS 50 threshold, the VOMS 100 threshold would not extend coverage to transit agencies located in relatively smaller UZAs, such as: Lafayette, IN; Duluth, MN-WI; Burlington, VT; State College, PA; Ames, IA; and, Olympia-Lacey, WA. *See id*. at pp. J-1 to J-9.

Lastly, it is important to assess the availability of federal funds for transit agencies' capital expenditures across the three studied VOMS thresholds given that deployment of automated

announcement systems (or ITS/AVL systems) constitute capital expenses.[72] Funding support for capital expenses by urban transit agencies comes largely from the federal government. For example, in 2014, federal funds (totaling $7.8 billion) accounted for 42% of all capital expenses by urban reporters.[73] Consequently, nearly all urban transit agencies receive federal monies for capital expenses, whether under DOT/FTA-administered formula grant programs, competitive grant programs, or both. *See, e.g.*, App. J, pp. J-1 to J-28.[74] Indeed, across the cumulative 171 urban transit agencies that would be covered under one of more of the three studied VOMS thresholds, about 95% reported using federal funds for capital expenditures in 2014. *Id*. Generally, while federal grants for capital expenses may be used on a variety of capital projects (such as replacing existing revenue vehicles, constructing subway facilities, purchasing communications systems, or building new passenger stations), there often are federal match requirements. For example, under the Urbanized Area Formula Grant program (49 U.S.C. § 5307) – which is the single largest federal capital grant program for public transit – the federal share cannot exceed 80% of the net expenditures for capital projects; however, for ADA-related capital expenditures, the federal share may be up to 90% of net project costs.[75]

To explore relative differences in the projected availability of federal funds for ADA-related bus transit projects – such as deployment of automated announcement systems or upgrading existing ITS/AVL, it was necessary to refine the per-agency data on federal capital funds listed in Appendix J. *See* App. J (column heading "Total Federal Capital Funds"). That is, because NTD data present only summary totals for monies expended under federal capital grant programs, several additional assumptions (and calculations) were needed to estimate how much of these capital funds might reasonably be considered available for ADA-related bus projects. First, to apportion total federal capital funds among different modes of service on a per-agency basis, it was assumed that each transit agency would allocate their respective capital expenditures on bus-related projects in an amount equal to their buses' pro rata share of total vehicle inventory (*i.e.*, ratio of Bus VOMS:Total VOMS). Second, because the Urbanized Area Grant program makes up the vast bulk of federal capital funds, it was further assumed that up to 90% of these federal funds could be used on ADA-related capital projects. These two assumptions were then applied on a per-agency basis to 2014 NTD data on federal capital funds, with the net result being an estimated figure representing the amount of federal capital funds available on a per-agency basis to

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[72] For an illustrative list of the types of capital expenditures by urban reporting agencies, see FTA, *2014 Reporting Year – NTD National Transit Summary & Trends: Appendix* 19-21 (Feb. 2015) (hereafter, "*2014 National Transit Appendix*"), available at: https://www.transit.dot.gov/ntd/2014-ntst-appendix.

[73] *See 2014 National Transit Summary & Trends,* supra, note 69, at 14; *2014 National Transit Appendix*, supra, note 72, at 23-24.

[74] FTA's website provides a comprehensive and searchable inventory of all DOT- and FTA-administered transit grant programs. *See* FTA, *Grant Programs*, https://www.transit.dot.gov/funding/grants/grant-programs (last accessed Nov. 7, 2016).

[75] See FTA, Urbanized Area Formula Grants – 5307, https://www.transit.dot.gov/funding/grants/urbanized-area-formula-grants-5307 (last accessed Nov. 7, 2016).

potentially offset deployment costs for automated announcement systems (or other ADA-related capital expenses).[76]

Presented below in Table 19 are the resulting estimates of federal capital funds available to transit agencies of various size groupings for ADA-related bus projects. The results in this table are broken down according to seven size-based categories of transit agencies (rather than by the three studied VOMS thresholds) to permit a more nuanced analysis of the data. The seven transit agency size categories mirror the VOMS-level groups used by FTA to report NTD annual data. *See* discussion, *supra*, p. 49 & n. 71.

Table 19: Estimated Federal Capital Funds Available for ADA-Related Bus Transit Projects by NTD Transit Agency Size Category (Based on 2014 NTD Data)

Transit Agency Size Category - Bus VOMS (by NTD Group)	Number of Transit Agencies	Federal Capital Funds Available (by NTD Group) – ADA-Related Bus Projects (Estimated)* ($1000s)	Federal Capital Funds Available (per Transit Agency) – ADA-Related Bus Projects (Estimated)* ($1000s)	Federal Capital Funds Available (per Bus) – ADA- Related Bus Projects (Estimated)*
1,000 & Over	9	1,974,898.6	219,433.2	60,886.7
250-499	28	810,428.6	28,943.9	51,627.3
100-249	52	659,211.9	12,677.2	49,736.5
50-99	71	202,521.3	2,852.4	24,147.3
25-49	118	311,425.5	2,639.2	43,882.7
10-24	181	138,808.0	766.9	25,150.9
Under 10	212	133,994.6	632.1	31,909.4
Total Agencies/Fed. Capital Funds Avail. (median) =	681	485,318.7 (median)	7,764.8 (median)	46,809.6 (median)

The foregoing data illuminates two important points. First, transit agencies with bus VOMS at or near (but not under) the VOMS 100 threshold appear as well-positioned as larger agencies to fund deployment of automated announcement systems using federal capital grant monies. Notably, estimated federal capital funds available to transit agencies in the 100-249 size category for ADA-related bus projects are – on a per-bus basis – nearly equal to the funds available to the next largest size category of transit agencies (250- 499 buses). This finding provides implicit support for one of the central assumptions underlying the Access Board's promulgation of the VOMS 100 threshold – namely, that covered transit agencies would have sufficient financial resources (including federal capital funds) to offset the costs of deploying automated announcement systems (or upgrading existing systems) on their

[76] Specifically, for each transit agency, the estimated amount of federal capital funds available for ADA-related bus projects was calculated according to the following formula: (Total Federal Capital Funds per 2014 NTD annual data) x (# bus VOMS/# total VOMS) x (.90).

fixed-route transit buses to the extent they had not already deployed such systems. Moreover, all of the transit agencies in the three size categories at or above the VOMS 100 threshold (*i.e.*, 1000 & Over, 250-499, and 100-249) have estimated totals of federal capital funds available for ADA-related bus projects that are above the median per-group, per-agency, and per-bus figures.

Second, for transit agencies below the VOMS 100 threshold, there is a distinct and sizeable drop-off in total estimated federal capital funds available for ADA-related bus projects s. For example, transit agencies in the size category immediately below the VOMS 100 threshold (*i.e.*, 50-99 buses) have, on a per-bus basis, only about half the federal capital funds available for such projects as do agencies in the next highest (100-249) size category. Additionally, transit agencies in each of the three size categories below the VOMS 100 threshold (*i.e.*, 50-99, 25-49, and Under 10), have total estimated federal capital funds available for ADA-related bus projects that fall below the median per-group, per-agency, and per-bus figures.

Collectively, these two considerations drawn from the federal capital funding data presented in Table 19 above underscore both the propriety and reasonableness of the Access Board's promulgation of a VOMS 100 threshold for large transit agencies subject to the automated announcement systems requirement.

9. SMALL BUSINESS ANALYSIS

As noted above, the Regulatory Flexibility Act ("RFA") generally requires federal agencies to assess the economic impact of regulatory action on small entities in terms of significance and proportionality as compared to other entities in the same industry.[77] Consistent with this requirement, the Final RA includes a separate "threshold" small business assessment that evaluates the economic impact of the final rule on "small businesses" in industry sectors that include OTRB-provided transportation, charter, or sightseeing services. The results of this small business "threshold" assessment shows that, while the final rule will undoubtedly affect a substantial number of "small business"-sized OTRB firms, its economic impact will be neither significant nor disproportionate relative to other firms.

As noted previously, *see supra* Section 4.3, approximately 2,600 firms—or about 95% of firms—in the four industry sectors most closely aligned with OTRB-provided transportation and other services qualify as "small businesses" (or firms) based on SBA small business size standards. Yet, while the final rule is thus expected to have widespread impact in terms of the number of affected small businesses, compliance costs for small firms that potentially operate OTRBs are not expected to be weighty. This conclusion is based on an assessment of the economic (cost) impact of the final rule on small businesses in terms of annualized per-facility costs, annualized per-facility costs as a percentage of annual receipts ("sales receipt test"), and annualized per-facility costs as a percentage of payroll costs ("payroll cost test").[78] A detailed discussion of the sources for, and methodology for compilation of, this small business data is provided in Appendix G.

None of these analyses demonstrate that the final rule will impose economically substantial costs on small businesses in the four industry sectors most closely aligned with provision of OTRB-related services. Annualized costs for small OTRB firms are only expected to be about $900 - $1,000 per vehicle under the primary cost scenario. *See* discussion *supra* Section 7.1.3 & Tbl. 13. Nor would such costs be disproportionately borne by small businesses. Table 18, below, demonstrates that costs for small OTRB firms are less than 10% of annual costs for other (non-small) firms in the same industry sectors.

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[77] *See* RFA § 605(b); *see also* Presidential Memorandum, "Regulatory Flexibility, Small Business, and Job Creation," 76 Fed. Reg. 3,827 (Jan. 21, 2011).

[78] *See*, *e.g.*, Small Business Administration/Office of Advocacy, *A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act* 17-19 (June 2010) (noting lack of single standard for determining "significant economic impact" under RFA but endorsing, among other measures, use of "sales test"); Small Business Administration/Office of Advocacy, *The Small Business Advocate* 5 (Aug.-Sept. 2004) (suggesting that regulatory action may lack economic significance if cost of proposed requirements fell below 1 percent of gross revenues or 5 percent of labor costs of small entities in affected industry).

Table 20 - Comparative Annual Per-Firm Costs of New OTRB Accessibility Requirements

Total Costs (Years 1 - 12)		Average Annual Costs Per Firm (Years 1 - 12)		
Other Firms	**Small Firms**	**Other Firms**	**Small Firms**	**Cost Per Firm Ratio (Small Firms/Other Firms)**
$4,409,689	$6,089,564	$2,466	$151	0.061

Annual costs for small OTRB firms, moreover, represent only a fraction of these firms' collective annual sales receipts and payrolls. Annual per-firm costs relative to sales receipts and payroll are presented in Tables 21 and 22 below. As depicted in these tables, both the "payroll cost test" and the "sales receipt test" demonstrate that annual compliance costs for the new OTRB requirements are expected to be less than 1% of annual payroll and sales receipts respectively.

Table 21 – Comparative Ratios of Annual Per-Firm Costs to Payroll

Average Annual Cost Per Firm		Ratio of Average Annual Per-Firm Costs to Payroll		
Other Firms	**Small Firms**	**Other Firms**	**Small Firms**	**Cost:Payroll Ratio (Small Firms/Others Firms)**
$2,466	$151	0.016%	0.040%	2.47

Table 22 – Comparative Ratios of Annual Per-Firm Costs to Sales Receipts

Average Annual Cost Per Firm		Ratio of Average Annual Per-Firm Costs to Sales Receipts		
Other Firms	**Small Firms**	**Other Firms**	**Small Firms**	**Cost: Sales Receipt Ratio (Small Firms/Other Firms)**
$2,466	$151	0.007%	0.013%	1.68

Comparative analysis of per firm annual cost-to-payroll and annual cost-to-sales receipt ratios for small OTRB firms versus other (larger) firms in the same industry sectors, moreover, shows that small firms will experience only modestly higher ratios. (The higher the ratio, the higher the cost burden relative to sales or payroll for small firms in comparison to larger firms.) The cost-to-payroll ratio for small OTRB firms is 2.47, while the cost-to-sales receipt ratio is slightly lower, at 1.68. Such ratios demonstrate that compliance costs under the final rule are distributed fairly equally amongst firms of all sizes in these industry sectors relative to their respective differences in sales receipts and payroll costs.

APPENDIX A: LARGE TRANSIT AGENCIES OVER VOMS 100 THRESHOLD FOR FIXED-ROUTE BUS MODES (2014 NTD DATA)

The table below presents data compiled from the 2014 National Transit Database (NTD) for transit agencies reporting operation of 100 or more vehicles in annual maximum service in fixed route bus service (Bus VOMS). The 2014 NTD provides data on four fixed-route bus modes, which are coded as follows: traditional transit bus fixed route service (MB); bus rapid transit (RB); commuter bus (CB); and trolley bus (TB). (**Note**: According to the *2014 NTD Policy Manual*, the "TB" mode includes only fixed route service using rubber-tired buses powered by electric current from overhead wires using trolley poles; replica or historic trolleys powered by onboard motors are not included in this mode.) With respect to "Type of Service," "DO" refers to direct operation by the reporting transit agency, while "PT" connotes fixed-route bus service provided to a public transit agency or governmental unit under a written contract with a public or private third-party transportation provider.

Table A - 1: Large Transit Agencies over VOMS 100 Threshold Based on 2014 NTD Data for Fixed-Route Bus Modes (Sorted by VOMS Size)

NTD ID #	Reporting Transit Agency	Mode of Service - Fixed-Route Buses (MOS)	Type of Service (TOS)	Vehicles Operated at Maximum Service - Fixed-Route Bus Modes (Bus VOMS)
20008	MTA New York City Transit	CB, MB, RB	DO	3,819
20080	New Jersey Transit Corporation	MB	DO, PT	2,047
90154	Los Angeles County Metropolitan Transportation Authority dba: Metro	MB, RB	DO, PT	1,904
50066	Chicago Transit Authority	MB	DO	1,568
30030	Washington Metropolitan Area Transit Authority	MB	DO, PT	1,342
30019	Southeastern Pennsylvania Transportation Authority	MB, TB	DO, PT	1,212
20188	MTA Bus Company	MB	DO	1,089
00001	King County Department of Transportation - Metro Transit Division	CB, MB, TB	DO, PT	1,080
60008	Metropolitan Transit Authority of Harris County, Texas	CB, MB	DO, PT	1,054
80006	Denver Regional Transportation District	MB	DO, PT	834
10003	Massachusetts Bay Transportation Authority	MB, RB, TB	DO, PT	817
30034	Maryland Transit Administration	CB, MB	DO, PT	803
50027	Metro Transit	MB	DO	769
40034	Miami-Dade Transit	MB	DO, PT	679
50113	Pace - Suburban Bus Division	MB	DO, PT	628
90015	San Francisco Municipal Railway	MB, TB	DO	616

NTD ID #	Reporting Transit Agency	Mode of Service - Fixed-Route Buses (MOS)	Type of Service (TOS)	Vehicles Operated at Maximum Service - Fixed-Route Bus Modes (Bus VOMS)
30022	Port Authority of Allegheny County	MB	DO	567
60056	Dallas Area Rapid Transit	MB	DO	544
00008	Tri-County Metropolitan Transportation District of Oregon	MB	DO	516
90036	Orange County Transportation Authority	CB, MB	DO, PT	489
90014	Alameda-Contra Costa Transit District	CB, MB	DO, PT	472
90026	San Diego Metropolitan Transit System	CB, MB	DO, PT	459
40022	Metropolitan Atlanta Rapid Transit Authority	MB	DO	450
90032	City of Phoenix Public Transit Department dba Valley Metro	MB	PT	447
90002	City and County of Honolulu Department of Transportation Services	MB	PT	431
80001	Utah Transit Authority	CB, MB	DO, PT	426
90013	Santa Clara Valley Transportation Authority	MB	DO, PT	381
50015	The Greater Cleveland Regional Transit Authority	MB, RB	DO	366
60011	VIA Metropolitan Transit	MB	DO	360
60048	Capital Metropolitan Transportation Authority	CB, MB	PT	339
90045	Regional Transportation Commission of Southern Nevada	MB, RB	PT	336
50008	Milwaukee County Transit System	MB	DO	334
70006	Bi-State Development Agency of the Missouri-Illinois Metropolitan District, d.b.a.(St. Louis) Metro	MB	DO	314
50154	Metropolitan Council	CB, MB	PT	307
50012	Southwest Ohio Regional Transit Authority	MB	DO	297
90136	Regional Public Transportation Authority, dba: Valley Metro	MB	PT	285
30051	Ride-On Montgomery County Transit	MB	DO	282
90009	San Mateo County Transit District	MB	DO, PT	278
90146	Foothill Transit	MB	PT	278
20076	Westchester County Bee-Line System	MB	PT	276
50016	Central Ohio Transit Authority	MB	DO	275
20004	Niagara Frontier Transportation Authority	MB	DO	269
40008	Charlotte Area Transit System	CB	DO	268
40029	Broward County Transit Division	MB	DO, PT	265
40035	Central Florida Regional Transportation Authority	CB, MB, RB	DO, PT	262

NTD ID #	Reporting Transit Agency	Mode of Service - Fixed-Route Buses (MOS)	Type of Service (TOS)	Vehicles Operated at Maximum Service - Fixed-Route Bus Modes (Bus VOMS)
20206	Nassau Inter County Express	MB	PT	252
90147	City of Los Angeles Department of Transportation	CB, MB	PT	252
30083	Transportation District Commission of Hampton Roads	MB	DO	233
00040	Central Puget Sound Regional Transit Authority	CB	DO, PT	231
50119	City of Detroit Department of Transportation	MB	DO	229
20122	Academy Lines, Inc.	CB	DO	225
20113	Regional Transit Service, Inc. and Lift Line, Inc.	MB	DO	221
10045	Connecticut Department of Transportation - CTTransit New Britain -Dattco	CB, MB	DO, PT	213
90033	City of Tucson	MB	DO	211
30068	Fairfax Connector Bus System	MB	PT	208
50031	Suburban Mobility Authority for Regional Transportation	MB	DO, PT	205
10001	Rhode Island Public Transit Authority	MB	DO	191
00029	Snohomish County Public Transportation Benefit Area Corporation	CB, MB	DO, PT	189
30075	Delaware Transit Corporation	MB	DO, PT	188
90166	LACMTA - Small Operators	MB	PT	188
90023	Long Beach Transit	MB	DO	185
40027	Pinellas Suncoast Transit Authority	CB, MB	DO, PT	182
20002	Capital District Transportation Authority	CB, MB	DO, PT	180
50005	Metro Transit System	MB	DO	179
70005	Kansas City Area Transportation Authority	MB, RB	DO	179
40018	Transit Authority of River City	MB	DO, PT	177
40041	Hillsborough Area Regional Transit Authority	MB	DO	162
20126	Hudson Transit Lines, Inc.	CB	DO	161
90019	Sacramento Regional Transit District	MB	DO	160
90016	Golden Gate Bridge, Highway and Transportation District	MB	DO	159
40040	Jacksonville Transportation Authority	MB	DO	158
90008	Santa Monica's Big Blue Bus	MB	DO	152
90031	Riverside Transit Agency	CB, MB	DO, PT	149
90029	Omnitrans	MB	DO, PT	144
10008	Pioneer Valley Transit Authority	MB	PT	141

NTD ID #	Reporting Transit Agency	Mode of Service - Fixed-Route Buses (MOS)	Type of Service (TOS)	Vehicles Operated at Maximum Service - Fixed-Route Bus Modes (Bus VOMS)
40004	Metropolitan Transit Authority	MB	DO	137
90030	North County Transit District	MB	PT	137
50033	Interurban Transit Partnership	MB, RB	DO	135
50050	Indianapolis and Marion County Public Transportation	MB	DO	133
60019	City of Albuquerque Transit Department	MB	DO	131
20072	Suffolk County Department of Public Works - Transportation Division	MB	PT	130
40037	Board of County Commissioners, Palm Beach County, PalmTran, Inc.	MB	DO	130
60007	Fort Worth Transportation Authority	MB	DO, PT	130
30006	Greater Richmond Transit Company	MB	DO	124
60006	Mass Transit Department - City of El Paso	MB	DO	124
20018	CNY Centro, Inc.	MB	DO	121
00003	Pierce County Transportation Benefit Area Authority	MB	DO	120
50017	Greater Dayton Regional Transit Authority	MB, TB	DO	120
30070	Potomac and Rappahannock Transportation Commission	CB, MB	PT	119
40003	Memphis Area Transit Authority	MB	DO	119
00002	Spokane Transit Authority	MB	DO	112
50010	METRO Regional Transit Authority	CB, MB	DO	112
50211	Rides Mass Transit District	MB	DO	112
20128	Suburban Transit Corporation	CB	DO	110
40086	Metropolitan Bus Authority	MB	DO	109
70010	Des Moines Area Regional Transit Authority	MB	DO	108
70002	Transit Authority of Omaha	MB	DO	107
40030	Gainesville Regional Transit System	MB	DO	104
40135	Georgia Regional Transportation Authority	CB	PT	101
	Bus VOMS Total (all large transit agencies) =			**39,423**

APPENDIX B – UNIT COSTS: AUTOMATED ANNOUNCEMENT SYSTEMS

Unit costs for this final regulatory assessment were developed for the new requirement for automated announcement systems to represent the likely low, medium, and high costs of compliance experienced by large transit agencies. Unit costs for the automated announcement systems requirement are assessed with respect to: initial (one-time) costs for onboard equipment (App. B-1); initial (one-time) costs for backend systems (App. B-2); initial training for transit agency personnel (App. B-3); annual operation and maintenance expenses (App. B-4); and, mid-life software upgrades for onboard equipment and backend systems (App. B-5). These unit costs are based largely on cost estimates used in the *Cost Estimates for Automated Stop Announcements* (July 2010) (hereafter, "2010 Preliminary RA"), which was prepared with the assistance of the Volpe National Transportation Center and published in conjunction with the Access Board's 2010 Notice of Proposed Rulemaking. Some adjustments were nonetheless made to unit cost estimates used in the Preliminary RA to update costs (*i.e.*, reflect passage of time) and to incorporate revisions to the cost model (*e.g.*, introduction of low, medium, and high cost scenarios). These updates and adjustments are discussed in greater detail in the body of this final report. *See* supra Section 5.2.

APPENDIX B-1: INITIAL (ONE-TIME) COSTS FOR ONBOARD BUS EQUIPMENT

Cost Element(s)	***Value(s)***	***Unit Cost Assumptions***	***Source(s)***
Onboard Equipment (per bus):			
Onboard Processor Next Stop Annunciator Cables & Brackets	Low: $2,558 Medium: $5,442 High: $5,986	***Low***: Assumes transit agency already deploys AVL technology and equips its buses with onboard processors, which can be mobile data terminals. Additional cost only for next stop annunciators with automated voice announcement software. ***Medium:*** Assumes transit agency has no existing ITS system in place. Unit cost represents onboard processor with automated voice announcement software, along with related installation hardware, for each bus. ***High:*** Same underlying assumptions as medium scenario (i.e., transit agency has no existing ITS system, needs onboard processor and annunciator), but with 10% higher costs.	Low/Medium cost scenarios: 2010 Preliminary RA/Volpe Center cost estimates (as updated by BLS/CPI inflation calculator).
GPS Receiver	Low: n/a Medium: $893 High: $982	***Low:*** Assumes transit agency already deploys AVL technology and equips its buses with GPS receivers. No new GPS receivers needed. ***Medium:*** Assumes transit agency has no existing ITS system in place. GPS receivers needed for each bus. ***High:*** Same underlying assumptions as medium scenario (i.e., transit agency has no existing ITS system, needs GPS receivers), but with 10% higher costs.	Low/Medium cost scenarios: 2010 Preliminary RA/Volpe Center cost estimates (as updated by BLS/CPI inflation calculator).

Cost Element(s)	*Value(s)*	*Unit Cost Assumptions*	*Source(s)*
Onboard Equipment (per bus):			
WLAN Adapter & Antenna	Low: n/a Medium: $637 High: $701	***Low:*** Assumes transit agency already deploys AVL technology and equips its buses with systems to communicate data. No new WLAN equipment needed. ***Medium:*** Assumes transit agency has no existing ITS system in place. WLAN adapter and receiver needed for each bus. ***High:*** Same underlying assumptions as medium scenario (i.e., transit agency has no existing ITS system, needs WLAN equipment), but with 10% higher costs.	Low/Medium cost scenarios: 2010 Preliminary RA/Volpe Center cost estimates (as updated by BLS/CPI inflation calculator).
Interior LED Sign	Low: n/a Medium: $708 High: $779	***Low:*** Assumes transit agency already equips buses with interior display signs for other informational purposes (e.g., to announce "Stop Requested" or "Please Exit Using Rear Door"). No new LED signs needed. ***Medium:*** Assumes transit agency neither has existing ITS system nor equips its buses with LED signs for other purposes. Interior LED sign needed on each bus for stop announcements. ***High:*** Same underlying assumptions as medium scenario (i.e., transit agency has no existing ITS system, no existing onboard LED signs), but with 10% higher costs.	Low/Medium cost scenarios: 2010 Preliminary RA/Volpe Center cost estimates (as updated by BLS/CPI inflation calculator).
External Speakers	Low: $54 Medium: $54 High: $59	Existing guidelines require buses to be equipped with public address systems and internal speakers. So only new cost -- under all three cost scenarios -- is equipping each bus with an external speaker for route announcements. Low and medium costs represent unit cost estimate from PRIA ($50), as updated by BLS/CPI inflation calculator. High cost is based on medium cost plus 10% upward adjustment.	Low/Medium cost scenarios: 2010 Preliminary RA/Volpe Center cost estimates (as updated by BLS/CPI inflation calculator).

APPENDIX B-2: INITIAL (ONE-TIME) COSTS FOR BACKEND SYSTEM

As discussed in the text of this final report, *see* supra Section 5.2.1, compliance costs for certain components of backend systems for automated announcement systems are expected to vary based on the size of a given large transit agency's fixed-route operations, with relatively smaller (*i.e.*, Tier I) agencies incurring somewhat lower compliance costs and relatively larger (*i.e.*, Tier III) agencies incurring higher costs. These cost components are: Software & Hardware; Stop Database Setup/Consolidation; Announcement Database Setup; and, System Testing. (These four cost components are also identified with an asterisk in the unit cost table below.)

Because unit costs for these four components are not inherently "scaled" for size—by, for example, being based per route or per bus—the unit costs for these components in the final regulatory assessment are proportionally scaled to adjust costs to better reflect the relative sizes of the three size-based tiers used to model compliance costs for large transit agencies. Costs listed here are unit costs used for a large transit agency in Tier II, which equates to assumed characteristics of the "sample" transit agency used in the 2010 Preliminary RA. Estimated unit costs for Tier I transit agencies are scaled by .75 to reflect their relatively smaller size, while costs for Tier III transit agencies are scaled by 1.25 to account for their larger size.

Cost Element(s)	***Value(s)***	***Unit Cost Assumptions***	***Source(s)***
Backend System:			
*Software & Hardware	Low: $48,979 Medium: $54,421 High: $59,863	Backend hardware and software costs assumed to include: global information system (GIS) software, announcement database software, recording and editing software, and computers and related hardware. Medium cost represents unit cost estimate used in the PRIA, as updated by BLS/CPI inflation calculator. Low and high costs are based on the medium cost estimate, but with respective 10% downward and upward cost adjustment.	Medium cost scenario: 2010 Preliminary RA/Volpe Center cost estimate (as updated by BLS/CPI inflation calculator).
WLAN System (per garage)	Low: n/a Medium: $47,564 High: $52,320	***Low:*** Assumes transit agency already deploys AVL technology and has established backend systems to communicate data. No new WLAN equipment needed. ***Medium:*** Assumes transit agency has no existing ITS system in place. WLAN system needed for each garage to communicate data. Unit cost for WLAN system includes: 7 WLAN access points per garage, Cat6 or fiber wiring, and WLAN firewall equipment. ***High:*** Same underlying assumptions as medium scenario (i.e., transit agency has no existing ITS system, needs WLAN equipment), but with 10% higher costs.	Low/Medium cost scenarios: 2010 Preliminary RA/Volpe Center cost estimates (as updated by BLS/CPI inflation calculator).

Cost Element(s)	*Value(s)*	*Unit Cost Assumptions*	*Source(s)*
Backend System:			
*Stop Database Setup/Consolidation	Low: n/a Medium: $2,177 High: $2,395	***Low:*** Assumes transit agency already deploys AVL technology and has established stop database and geocoded locations for stops. No new Stop Database costs. ***Medium:*** Assumes transit agency has no existing ITS system in place, and a stop database needs to be setup or consolidated from any existing stop database that is used for other purposes. Unit cost represents cost to set-up new database or consolidate existing stop database. ***High:*** Same underlying assumptions as medium scenario (i.e., transit agency has no existing ITS system, needs stop database setup/consolidation), but with 10% higher costs.	Medium cost scenario: 2010 Preliminary RA/Volpe Center cost estimate (as updated by BLS/CPI inflation calculator).
Geocoding Costs (per route)	Low: n/a Medium: $1,088 High: $1,197	***Low:*** Assumes transit agency already deploys AVL technology and has established stop database and geocoded locations for stops. No new Stop Database costs. ***Medium:*** Assumes transit agency has no existing ITS system in place, and needs to establish a stop database with geocoded stop locations. Unit costs represent the estimated cost to geocode all stop locations on a per-route basis. ***High:*** Same underlying assumptions as medium scenario (i.e., transit agency has no existing ITS system, needs to geocode all stop locations), but with 10% higher costs.	Medium cost scenario: 2010 Preliminary RA/Volpe Center cost estimate (as updated by BLS/CPI inflation calculator).

Cost Element(s)	*Value(s)*	*Unit Cost Assumptions*	*Source(s)*
Backend System:			
*Announcement Database Setup	Low: $28,485 Medium: $84,612 High: $106,542	***Low:*** Assumes transit agency has up-to-date operator call sheets that can be readily entered into the announcement database. Announcement database set-up costs estimated to include full-time work by an IT/GIS specialist, as well as quarter-time oversight by an IT project manager, for a 3-month period. (Wage rates for IT/GIS specialist and IT project manager based on low cost scenario wages listed below in Appendix B - 3.) ***Medium:*** Assumes transit agency reevaluates what stops to announce, and incurs additional labor costs in transferring data from the scheduling database (e.g., HASTUS) to the announcement database because the database schemas do not match exactly. Announcement database set-up costs estimated to include full-time work by an IT/GIS specialist, as well as quarter-time oversight by an IT project manager, for a 7-month period. (Wage rates for IT/GIS specialist and IT project manager based on medium cost scenario wages listed below in Appendix B - 3.) ***High:*** Same underlying assumptions as medium scenario (i.e., transit agency has no existing ITS system, needs to geocode stop locations), but using high cost scenario wages for IT/GIS specialist and IT project manager from App. B - 3, below.	Low/Medium cost scenarios: 2010 Preliminary RA/Volpe Center cost assumptions. All cost scenarios: Wage rates for IT/GIS specialist and IT project manager, App. B - 3.
Recording/Editing Announcements	Low: $490 Medium: $544 High: $598	Stop and route announcements must be recorded and edited, and these recordings must be entered in the announcement database. Medium cost represents unit cost estimate used in the PRIA, as updated by BLS/CPI inflation calculator. Low and high costs based on medium cost estimate, but with respective 10% downward and upward cost adjustment.	Medium cost scenario: 2010 Preliminary RA/Volpe Center cost estimate (as updated by BLS/CPI inflation calculator).

Cost Element(s)	*Value(s)*	*Unit Cost Assumptions*	*Source(s)*
Backend System:			
*System Testing	Low: $1,614 Medium: $6,168 High: $7,766	***Low:*** Assumed that stops to be announced are few or highly separated, and minimal system testing is required to ensure that the geofences do not overlap or conflict. System testing estimated to include 40 hours of work by an IT/GIS specialist. (Wage rate for IT/GIS specialist based on low cost scenario wages listed below in Appendix B - 3.) ***Medium:*** Assumed that a high density network of stops will be announced, and every route needs to be tested to ensure that geofences do not overlap or conflict. System testing estimated to include 120 hours of work by an IT/GIS specialist. (Wage rate for IT/GIS specialist based on medium cost scenario wages listed below in Appendix B - 3.) ***High:*** Same underlying assumptions as medium scenario (i.e., stop database needs extensive testing), but using high cost scenario wages for IT/GIS specialist from App. B - 3, below.	Low/Medium cost scenarios: 2010 Preliminary RA/Volpe Center cost assumptions. All cost scenarios: Wage rates for IT/GIS specialist, App. B - 3.

*(***Note***: Cost scaling used to adjust assumed backend costs based on transit agency size and relative backend system needs. Costs listed are unit costs used for a large transit agency in Tier II. Estimated unit costs used in this final regulatory assessment for Tier I transit agencies are scaled by .75 to reflect their relatively smaller size, while costs for Tier III transit agencies are scaled by 1.25 to account for their larger size.)

APPENDIX B-3: TRAINING COST ASSUMPTIONS/LABOR COSTS

Cost Element(s)	*Value(s)*	*Unit Cost Assumptions*	*Source(s)*
Labor/Training Costs			
Vehicle Operators (hourly wages)	Low: $19.55 Medium: $27.03 High: $35.94	***Training Cost Assumptions:*** Assumed that all vehicle operators receive a one-hour training on using automated announcements. Also assumed that subsequent refresher training can be incorporated into transit agency's ongoing training program at minimal or no cost. ***Labor Costs:*** Estimated hourly wage rates for vehicle operators derived from May 2014 Occupation Employment Statistics (OES) published by the Bureau of Labor Statistics. The medium scenario is based on the median national hourly wage, while the low and high scenarios respectively use hourly wages at the 25th and 75th percentiles nationally. Under each scenario, OES hourly wages are then multiplied by 1.5 to adjust for benefits.	***Training/Labor classification assumptions:*** 2010 Preliminary RA/Volpe Center. **Wage rates:** Bureau of Labor Statistics, Occupational Employment and Wages (May2014), Standard Occupation Classification (SOC) 53-3021 (Bus Drivers, Transit & Inter-City).
Mechanics (hourly wages)	Low: $25.04 Medium: $31.47 High: $39.47	***Training Cost Assumptions:*** Assumed that 10% of each transit agency's mechanics receive a one-hour training on repairing automated announcement equipment. Also assumed that subsequent refresher training can be incorporated into transit agency's ongoing training program at minimal or no cost. ***Labor Costs:*** Estimated hourly wage rates for bus mechanics derived from May 2014 Occupation Employment Statistics (OES) published by the Bureau of Labor Statistics. The medium scenario is based on the median national hourly wage, while the low and high scenarios respectively use hourly wages at the 25th and 75th percentiles nationally. Under each scenario, OES hourly wages are then multiplied by 1.5 to adjust for benefits.	***Training/Labor classification assumptions:*** 2010 Preliminary RA/Volpe Center. ***Wage rates:*** Bureau of Labor Statistics, Occupational Employment and Wages (May2014), SOC 49-3031 (Bus & Truck Mechanics).

Cost Element(s)	*Value(s)*	*Unit Cost Assumptions*	*Source(s)*
Labor/Training Costs			
IT/GIS Specialist (annual wages)	Low: $83,955 Medium: $106,890 High: $134,595	***Training Costs:*** n/a ***Labor Costs:*** Estimated annual wage rates for an IT/GIS specialist derived from May 2014 National Industry-Specific Occupational Wage Estimates tables (OES) published by the Bureau of Labor Statistics. The medium scenario is based on the median national annual wage, while the low and high scenarios respectively use annual wages at the 25th and 75th percentiles nationally. Under each scenario, OES annual wages are then multiplied by 1.5 to adjust for benefits.	***Labor classification assumptions:*** 2010 Preliminary RA/Volpe Center. W***age rates:*** Bureau of Labor Statistics, Occupational Employment and Wages (May2014), NAICS 999300 (Local Govt., excluding schools and hospitals), SOC 15-1140 (Database and Systems Administrators).
IT Project Manager (annual wages)	Low: $119,938 Medium: $152,703 High: $192,22	***Training Costs:*** n/a ***Labor Costs:*** Because the May 2014 National Industry-Specific Occupational Wage Estimates tables (OES) published by the Bureau of Labor Statistics do not contain an "IT project manager" job classification, annual wage rates for an IT project manager were developed, under each cost scenario (i.e., low, medium, and high), by multiplying the annual wages for an IT/GIS specialist (listed above) by 1.4286. This latter figure replicates the ratio of annual wages for IT project manager and IT/GIS specialist reflected in PRIA labor cost estimates. *See* PRIA, App. C.	***Labor classification assumptions:*** 2010 Preliminary RA/Volpe Center. ***Wage rates:*** Bureau of Labor Statistics, Occupational Employment and Wages (May2014), NAICS 999300 (Local Govt., excluding schools and hospitals), SOC 15-1140 (Database and Systems Administrators).

APPENDIX B-4: ANNUAL COSTS – OPERATION & MAINTENANCE

Cost Element(s)	*Value(s)*	*Unit Cost Assumptions*	*Source(s)*
Bus Equipment			
Spare Parts (as % total bus equip. costs)	Low: 4% Medium: 5% High: 6%	Assumed that, for any transit agency in any given year, the annual cost for spare parts to repair or replace onboard equipment is equal to a fixed percentage of the total cost for onboard equipment installed on buses that year. The medium scenario assumes spare parts represent 5% of total bus equipment costs, while the low and high scenarios assume spare parts costs of 3% and 6% respectively.	Medium cost scenario: 2010 Preliminary RA/Volpe Center cost estimate.
Repair Costs (per bus)	Low: $7.81 Medium: $9.82 High: $12.31	Based on information provided by transit agencies, the PRIA assumed that the average weekly equipment failure rate per bus was 0.3%, and that average repair time for each equipment failure was 2 hours. The FRIA retains these repair cost assumptions, but applies them using updated hourly wage rates for bus mechanics (*see* App. B - 3). Based on these assumptions, the medium per-bus cost for equipment repair is estimated to be $ 9.82 annually [.003 average weekly equipment failure rate per bus x 52 weeks x 2 hours per repair x $31.47 bus mechanics hourly wage]. Low and high costs for bus equipment repair are estimated in similar fashion, though using instead the low and high hourly wage rates for bus mechanics respectively (see App. B - 3).	Medium cost scenario: 2010 Preliminary RA/Volpe Center cost estimate.
Backend System			
Database Updates & Maintenance (Hardware & Software)	Low: $27,957 Medium: $35,594 High: $44,820	Assumed that performing operations and maintenance tasks on the backend system involves work by an IT/GIS specialist 1 month per quarter, or 4 months per year. The Medium cost scenario uses medium wage rate for IT/GIS specialist (see App. B - 3.), while low and high scenarios respectively use low and high wage rates for IT/GIS specialist (see App. B - 3).	Medium cost scenario: 2010 Preliminary RA/Volpe Center cost estimate (as updated by BLS/CPI inflation calculator).

APPENDIX B-5: MID-LIFE SOFTWARE UPGRADE COSTS

Cost Element(s)	*Value(s)*	*Unit Cost Assumptions*	*Source(s)*
Mid-Life Software Upgrade			
Onboard Bus Equipment (per bus)	Low: $142 Medium: $158 High: $174	Assumed that each transit agency's onboard bus equipment (e.g., onboard processor, mobile data terminal) requires one mid-life software upgrade during the 12-year regulatory horizon. Upgrade costs are assumed to be apportioned equally between years 5 and 6. The medium cost represents the unit cost estimate used in the PRIA ($145 per bus), as updated by BLS/CPI inflation calculator. The low and high costs are based on the medium cost estimate, but with 10% downward and upward adjustment respectively.	Medium cost scenario: 2010 Preliminary RA/Volpe Center cost estimate (as updated by BLS/CPI inflation calculator).
Backend System (per system/agency)	Low: $1,390 Medium: $1,544 High: $1,698	Assumed that the backend system (e.g., onboard processor, mobile data terminal) for each transit agency's automated announcement system requires one mid-life software upgrade during the 12-year regulatory horizon. Upgrade costs are assumed to be apportioned equally between years 5 and 6. The medium cost represents the unit cost estimate used in the PRIA ($145 per bus), as updated by BLS/CPI inflation calculator. The low and high costs are based on the medium cost estimate, but with 10% downward and upward adjustment respectively.	Medium cost scenario: 2010 Preliminary RA/Volpe Center cost estimate (as updated by BLS/CPI inflation calculator).

APPENDIX C – UNIT COSTS: NEW ACCESSIBILITY REQUIREMENTS FOR OTRBS

UNIT COSTS FOR NEW OTRB ACCESSIBILITY REQUIREMENTS (PER BUS)

	Low	Medium	High
Identification of Wheelchair Spaces and Accessible Doorways* (ISA Signs/Decals)	$9	$18	$30
Priority Seating Signs*	$30	$70	$110
Exterior Destination/Route Signage	$640	$800	$960
Public Address System	$600	$750	$900
Stop Request System	$240	$300	$360

(**Note*: Each OTRB is assumed to have two wheelchair spaces and one accessible doorway for which ISA identification is required. Accordingly, the per-vehicle unit costs listed above reflect costs for three ISA signs or decals. For priority seating, each OTRB operated in fixed-route service is required to designate two priority seats. Per-vehicle unit costs for signage at priority seating thus reflect costs for two signs.)

OTRBS – OPERATION & MAINTENANCE COSTS

	Low	Medium	High
Annual Operation & Maintenance Costs (as % of total annual bus equipment costs)	1.0%	2.0%	3.0%

OTRBS – PROJECTED GROWTH RATES (U.S. DOMESTIC FLEET)

	Low	Medium	High
Annual Growth Rate	-1.0%	0.0%	1.0%

APPENDIX D – OTRB ACCESSIBILITY REQUIREMENTS: LIKELIHOOD OF INCURRING COSTS

The table below provides the assumed values used in the cost model regarding the likelihood that a typical over-the-road bus (OTRB) will both have a covered element (such as an exterior destination sign) and incur compliance costs under the final rule. All percentages represent likelihoods relative to the entire U.S. fleet of OTRBs. For requirements applicable to fixed-route service only, it is assumed that 30% of OTRBs are used in such service. Also provided below are the sources used to develop estimated likelihood values.

	Low Scenario	Primary Scenario	High Scenario	Discussion/Source(s)
Identification of Accessible Seating and Doorways	100%	100%	100%	**Condition for Change**: Required wheelchair spaces and doorways with accessible means of boarding and alighting must be identified by the International Symbol of Accessibility (ISA) on all OTRBs (since all OTRBs are large vehicles). Compliance costs assumed when wheelchair spaces and accessible doorways on a new OTRB are not expected, based on current industry practice or assumed mode of operation, to have the requisite ISA sign or decal absent a requirement in the final rule. OTRBs are not currently required to identify wheelchair spaces or doorways. Since scant information is available on current industry practices, conservatively assumed that OTRBs do not typically provide such identification. **Source(s)**: Access Board subject matter expert.
Priority Seating Signs	27%	28.5%	30%	**Condition for Change**: Requirement only applies to OTRBs used in fixed-route service. Priority seats must be identified by sign informing passengers that such seats are for use by persons with disabilities. Compliance costs assumed when priority seating is not expected, based on current industry practice or assumed mode of operation, to have the requisite signage absent a requirement in the final rule. OTRBs are not currently required to provide priority seats. Some OTRBs operating as commuter buses do nonetheless provide both priority seating and signage for such seats. However, since scant information is available on current industry practices, so it is conservatively assumed that OTRBs used in fixed-route service do not typically provide signs for priority seating. Assumed that following proportions of OTRBs in fixed route service will incur compliance costs for priority seating signs: 90% (low), 95% (medium), and 100% (high). **Source(s)**: Access Board subject matter expert. Visual "survey" of OTRBs operating in fixed-route services in the Washington, D.C. metro area (Access Board staff - 2015).

	Low Scenario	Primary Scenario	High Scenario	Discussion/Source(s)
Exterior Destination/ Route Signage	35.0%	45.0%	55.0%	**Condition for Change**: Where destination or route signs are provided on the exterior of an OTRB, such signage must be located on both the front and boarding side of the vehicle. Compliance costs assumed when a new OTRB is expected, based on current industry practice or assumed mode of operation, to provide exterior signage, but only in one location (typically, the front of the vehicle) absent a requirement in the final rule. Nearly all OTRBs used in fixed-route service as commuter buses currently provide compliant exterior destination/route signage in both locations. OTRBs used in other types of fixed-route service (such as inter-city transportation) typically provide exterior signage only on the front of the vehicle. Provision of exterior destination/route signage by OTRBs used in charter or sightseeing service varies, but, if such signage is provided, it generally is located only on the front of the vehicle. **Source(s)**: Information provided by OTRB manufacturers and transit agencies; Visual "survey" of OTRBs operating in fixed-route and charter services in the Washington, D.C. metro area (Access Board staff - 2015).
Public Address System	0.6%	1.5%	2.4%	**Condition for Change**: Requirement only applies to OTRBs used in fixed-route service. Public address systems must provide electronic amplification systems capable of broadcasting onboard announcements to passengers. Compliance costs assumed when a new OTRB operating in fixed route service is not expected, based on current industry practice, to have a PA system installed on the vehicle absent a requirement in the final rule. Nearly all new OTRBs are currently built with OEM-installed public address systems, either as standard equipment or through customer-requested specification. Assumed that following proportions of OTRBs in fixed route service will incur compliance costs for public address systems: 2% (low), 5% (medium), and 8% (high). **Source(s)**: Access Board subject matter expert. **Source(s)**: Information provided by OTRB manufacturers; APTA 2015 Vehicle Database.

	Low Scenario	Primary Scenario	High Scenario	Discussion/Source(s)
Stop Request System	7.7%	8.1%	8.6%	**Condition for Change**: Requirement only applies to OTRBs used in fixed route service that stop on passenger request. Mechanisms for requesting stops must be located within reach of each required wheelchair space and priority seat on the vehicle. Compliance costs assumed when a new OTRB is used in fixed route service and stops on passenger request, but is not expected, based on current industry practice, to have the requisite stop request mechanisms installed onboard absent a requirement in the final rule. Assumed that, of OTRBs operating in fixed-route service, one-third stop on passenger request. Also assumed that the following proportions of OTRBs in fixed route service that stop on passenger request will incur compliance costs for stop request systems: 85% (low), 90% (medium), and 95% (high). **Source(s)**: Information provided by OTRB manufacturers; Access Board subject matter experts.

APPENDIX E-1: ANNUAL COSTS FOR AUTOMATED ANNOUNCEMENT SYSTEMS UNDER PRIMARY SCENARIO BY TRANSIT AGENCY CATEGORY (TIERS I, II & III)

Automated Stop Announcement Costs for Large Transit Agency - Tier I (Primary Scenario)									
Regulatory Year	**One-Time Costs**		***Training***	**O&M Costs**		**Mid-Life Software Upgrade**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
	Bus Equipment	***Backend System***		***Bus Equipment***	***Backend System***				
Year 1	$52,623	$169,193	$6,889	$2,784	$6,674	$0	$238,164	$238,164	$238,164
Year 2	$52,623	$0	$350	$2,905	$26,696	$0	$82,573	$80,096	$76,793
Year 3	$52,623	$0	$350	$3,023	$26,696	$0	$82,691	$77,729	$71,941
Year 4	$52,623	$0	$350	$3,140	$26,696	$0	$82,809	$76,184	$67,903
Year 5	$52,623	$0	$350	$3,258	$26,696	$0	$82,927	$73,805	$63,024
Year 6	$52,623	$0	$350	$3,386	$26,696	$4,528	$87,583	$75,321	$62,184
Year 7	$52,623	$0	$350	$3,514	$26,696	$4,528	$87,710	$73,677	$58,766
Year 8	$52,623	$0	$350	$3,641	$26,696	$0	$83,310	$67,481	$51,652
Year 9	$52,623	$0	$350	$3,779	$26,696	$0	$83,447	$65,923	$48,399
Year 10	$52,623	$0	$350	$3,916	$26,696	$0	$83,585	$64,360	$45,136
Year 11	$52,623	$0	$350	$4,054	$26,696	$0	$83,722	$61,954	$42,698
Year 12	$52,623	$0	$350	$4,201	$26,696	$0	$83,869	$60,386	$40,257
Total	$631,480	$169,193	$10,734	$41,600	$300,324	$9,057	$1,162,389	$1,015,080	$866,917
Annualized								$87,502	$80,659

Automated Stop Announcement Costs for Large Transit Agency - Tier II (Primary Scenario)									
Regulatory Year	**One-Time Costs**		***Training***	**O&M Costs**		**Mid-Life Software Upgrade**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
	Bus Equipment	***Backend System***		***Bus Equipment***	***Backend System***				
Year 1	$117,255	$304,912	$14,446	$6,175	$8,899	$0	$451,686	$451,686	$451,686
Year 2	$117,255	$0	$729	$6,401	$35,594	$0	$159,978	$155,179	$148,780
Year 3	$117,255	$0	$729	$6,627	$35,594	$0	$160,204	$150,592	$139,378
Year 4	$117,255	$0	$729	$6,852	$35,594	$0	$160,430	$147,596	$131,553
Year 5	$117,255	$0	$729	$7,078	$35,594	$0	$160,656	$142,984	$122,099
Year 6	$117,255	$0	$729	$7,304	$35,594	$7,811	$168,693	$145,076	$119,772
Year 7	$117,255	$0	$729	$7,530	$35,594	$7,811	$168,919	$141,892	$113,176
Year 8	$117,255	$0	$729	$7,756	$35,594	$0	$161,334	$130,680	$100,027
Year 9	$117,255	$0	$729	$7,982	$35,594	$0	$161,559	$127,632	$93,704
Year 10	$117,255	$0	$729	$8,208	$35,594	$0	$161,785	$124,575	$87,364
Year 11	$117,255	$0	$729	$8,433	$35,594	$0	$162,011	$119,888	$82,626
Year 12	$117,255	$0	$729	$8,659	$35,594	$0	$162,237	$116,811	$77,874
Total	$1,407,056	$304,912	$22,466	$89,004	$400,433	$15,623	$2,239,494	$1,954,590	$1,668,038
Annualized								$168,392	$154,985

Automated Stop Announcement Costs for Large Transit Agency - Tier III (Primary Scenario)									
Regulatory Year	**One-Time Costs**		***Training***	**O&M Costs**		**Mid-Life Software Upgrade**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
	Bus Equipment	***Backend System***		***Bus Equipment***	***Backend System***				
Year 1	$227,612	$427,068	$28,059	$11,813	$11,123	$0	$705,674	$705,674	$705,674
Year 2	$227,612	$0	$1,396	$12,245	$44,493	$0	$285,745	$277,172	$265,743
Year 3	$227,612	$0	$1,396	$12,677	$44,493	$0	$286,177	$269,006	$248,974
Year 4	$227,612	$0	$1,396	$13,109	$44,493	$0	$286,609	$263,680	$235,019
Year 5	$227,612	$0	$1,396	$13,541	$44,493	$0	$287,041	$255,467	$218,151
Year 6	$227,612	$0	$1,396	$13,973	$44,493	$13,710	$301,183	$259,018	$213,840
Year 7	$227,612	$0	$1,396	$14,405	$44,493	$13,710	$301,615	$253,357	$202,082
Year 8	$227,612	$0	$1,396	$14,837	$44,493	$0	$288,337	$233,553	$178,769
Year 9	$227,612	$0	$1,396	$15,269	$44,493	$0	$288,769	$228,128	$167,486
Year 10	$227,612	$0	$1,396	$15,701	$44,493	$0	$289,201	$222,685	$156,169
Year 11	$227,612	$0	$1,396	$16,133	$44,493	$0	$289,634	$214,329	$147,713
Year 12	$227,612	$0	$1,396	$16,566	$44,493	$0	$290,066	$208,847	$139,231
Total	$2,731,344	$427,068	$43,410	$170,269	$500,541	$27,420	$3,900,052	$3,390,916	$2,878,852
Annualized								$290,974	$264,968

APPENDIX E-2: ANNUAL COSTS FOR AUTOMATED ANNOUNCEMENT SYSTEMS UNDER LOW SCENARIO BY TRANSIT AGENCY CATEGORY (TIERS I, II & III)

Automated Stop Announcement Costs for Large Transit Agency - Tier I (Low Scenario)									
Regulatory Year	**One-Time Costs**		***Training***	**O&M Costs**		**Mid-Life Software Upgrade**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
	Bus Equipment	***Backend System***		***Bus Equipment***	***Backend System***				
Year 1	$28,152	$59,799	$4,996	$1,235	$5,242	$0	$99,423	$99,423	$99,423
Year 2	$28,152	$0	$252	$1,321	$20,968	$0	$50,692	$49,171	$47,144
Year 3	$28,152	$0	$252	$1,415	$20,968	$0	$50,786	$47,739	$44,184
Year 4	$28,152	$0	$252	$1,509	$20,968	$0	$50,880	$46,809	$41,721
Year 5	$28,152	$0	$252	$1,602	$20,968	$0	$50,973	$45,366	$38,740
Year 6	$28,152	$0	$252	$1,704	$20,968	$4,072	$55,147	$47,426	$39,154
Year 7	$28,152	$0	$252	$1,805	$20,968	$4,072	$55,249	$46,409	$37,017
Year 8	$28,152	$0	$252	$1,907	$20,968	$0	$51,278	$41,535	$31,792
Year 9	$28,152	$0	$252	$2,016	$20,968	$0	$51,387	$40,596	$29,805
Year 10	$28,152	$0	$252	$2,126	$20,968	$0	$51,497	$39,652	$27,808
Year 11	$28,152	$0	$252	$2,235	$20,968	$0	$51,606	$38,188	$26,319
Year 12	$28,152	$0	$252	$2,352	$20,968	$0	$51,723	$37,241	$24,827
Total	$337,819	$59,799	$7,764	$21,227	$235,887	$8,144	$670,640	$579,556	$487,933
Annualized								$49,413	$44,208

Automated Stop Announcement Costs for Large Transit Agency - Tier II (Low Scenario)									
Regulatory Year	**One-Time Costs**		***Training***	**O&M Costs**		**Mid-Life Software Upgrade**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
	Bus Equipment	***Backend System***		***Bus Equipment***	***Backend System***				
Year 1	$59,205	$79,568	$10,476	$2,583	$6,989	$0	$158,822	$158,822	$158,822
Year 2	$59,205	$0	$525	$2,762	$27,957	$0	$90,450	$87,736	$84,118
Year 3	$59,205	$0	$525	$2,942	$27,957	$0	$90,629	$85,192	$78,847
Year 4	$59,205	$0	$525	$3,122	$27,957	$0	$90,809	$83,544	$74,463
Year 5	$59,205	$0	$525	$3,301	$27,957	$0	$90,989	$80,980	$69,151
Year 6	$59,205	$0	$525	$3,481	$27,957	$7,023	$98,191	$84,444	$69,715
Year 7	$59,205	$0	$525	$3,660	$27,957	$7,023	$98,370	$82,631	$65,908
Year 8	$59,205	$0	$525	$3,840	$27,957	$0	$91,527	$74,137	$56,747
Year 9	$59,205	$0	$525	$4,020	$27,957	$0	$91,707	$72,449	$53,190
Year 10	$59,205	$0	$525	$4,199	$27,957	$0	$91,887	$70,753	$49,619
Year 11	$59,205	$0	$525	$4,379	$27,957	$0	$92,066	$68,129	$46,954
Year 12	$59,205	$0	$525	$4,559	$27,957	$0	$92,246	$66,417	$44,278
Total	$710,464	$79,568	$16,251	$42,848	$314,516	$14,045	$1,177,693	$1,015,233	$851,813
Annualized								$86,332	$76,678

Automated Stop Announcement Costs for Large Transit Agency - Tier III (Low Scenario)									
Regulatory Year	**One-Time Costs**		***Training***	**O&M Costs**		**Mid-Life Software Upgrade**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
	Bus Equipment	***Backend System***		***Bus Equipment***	***Backend System***				
Year 1	$114,928	$99,338	$20,349	$4,941	$8,737	$0	$248,292	$248,292	$248,292
Year 2	$114,928	$0	$1,017	$5,284	$34,946	$0	$156,176	$151,491	$145,244
Year 3	$114,928	$0	$1,017	$5,628	$34,946	$0	$156,520	$147,128	$136,172
Year 4	$114,928	$0	$1,017	$5,972	$34,946	$0	$156,863	$144,314	$128,628
Year 5	$114,928	$0	$1,017	$6,315	$34,946	$0	$157,207	$139,914	$119,477
Year 6	$114,928	$0	$1,017	$6,659	$34,946	$12,324	$169,874	$146,092	$120,611
Year 7	$114,928	$0	$1,017	$7,003	$34,946	$12,324	$170,218	$142,983	$114,046
Year 8	$114,928	$0	$1,017	$7,346	$34,946	$0	$158,238	$128,173	$98,107
Year 9	$114,928	$0	$1,017	$7,690	$34,946	$0	$158,581	$125,279	$91,977
Year 10	$114,928	$0	$1,017	$8,034	$34,946	$0	$158,925	$122,372	$85,820
Year 11	$114,928	$0	$1,017	$8,377	$34,946	$0	$159,269	$117,859	$81,227
Year 12	$114,928	$0	$1,017	$8,721	$34,946	$0	$159,612	$114,921	$76,614
Total	$1,379,136	$99,338	$31,539	$81,969	$393,145	$24,648	$2,009,775	$1,728,818	$1,446,215
Annualized								$146,677	$129,444

APPENDIX E-3: ANNUAL COSTS FOR AUTOMATED ANNOUNCEMENT SYSTEMS UNDER HIGH SCENARIO BY TRANSIT AGENCY CATEGORY (TIERS I, II & III)

Automated Stop Announcement Costs for Large Transit Agency - Tier I (High Scenario)									
Regulatory Year	**One-Time Costs**		***Training***	**O&M Costs**		**Mid-Life Software Upgrade**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
	Bus Equipment	***Backend System***		***Bus Equipment***	***Backend System***				
Year 1	$91,687	$277,164	$4,996	$5,750	$8,404	$0	$388,000	$388,000	$388,000
Year 2	$91,687	$0	$252	$5,885	$33,615	$0	$131,439	$127,495	$122,238
Year 3	$91,687	$0	$252	$6,439	$33,615	$0	$131,992	$124,073	$114,833
Year 4	$91,687	$0	$252	$6,587	$33,615	$0	$132,140	$121,569	$108,355
Year 5	$91,687	$0	$252	$6,735	$33,615	$0	$132,288	$117,736	$100,539
Year 6	$91,687	$0	$252	$6,895	$33,615	$4,985	$137,432	$118,192	$97,577
Year 7	$91,687	$0	$252	$7,055	$33,615	$4,985	$137,592	$115,578	$92,187
Year 8	$91,687	$0	$252	$7,215	$33,615	$0	$132,768	$107,542	$82,316
Year 9	$91,687	$0	$252	$7,387	$33,615	$0	$132,940	$105,023	$77,105
Year 10	$91,687	$0	$252	$7,559	$33,615	$0	$133,113	$102,497	$71,881
Year 11	$91,687	$0	$252	$7,732	$33,615	$0	$133,285	$98,631	$67,975
Year 12	$91,687	$0	$252	$7,916	$33,615	$0	$133,470	$96,098	$64,065
Total	$1,100,239	$277,164	$7,764	$83,154	$378,169	$9,969	$1,856,459	$1,622,433	$1,387,072
Annualized								$139,970	$129,305

Automated Stop Announcement Costs for Large Transit Agency - Tier II (High Scenario)									
Regulatory Year	**One-Time Costs**		***Training***	**O&M Costs**		**Mid-Life Software Upgrade**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
	Bus Equipment	***Backend System***		***Bus Equipment***	***Backend System***				
Year 1	$192,825	$522,554	$19,178	$12,023	$11,205	$0	$757,785	$757,785	$757,785
Year 2	$192,825	$0	$961	$12,306	$44,820	$0	$250,912	$243,385	$233,348
Year 3	$192,825	$0	$961	$12,589	$44,820	$0	$251,195	$236,123	$218,540
Year 4	$192,825	$0	$961	$12,872	$44,820	$0	$251,478	$231,360	$206,212
Year 5	$192,825	$0	$961	$13,155	$44,820	$0	$251,761	$224,068	$191,339
Year 6	$192,825	$0	$961	$13,438	$44,820	$8,600	$260,645	$224,154	$185,058
Year 7	$192,825	$0	$961	$13,722	$44,820	$8,600	$260,928	$219,179	$174,822
Year 8	$192,825	$0	$961	$14,005	$44,820	$0	$252,611	$204,615	$156,619
Year 9	$192,825	$0	$961	$14,288	$44,820	$0	$252,894	$199,786	$146,678
Year 10	$192,825	$0	$961	$14,571	$44,820	$0	$253,177	$194,946	$136,716
Year 11	$192,825	$0	$961	$14,854	$44,820	$0	$253,460	$187,561	$129,265
Year 12	$192,825	$0	$961	$15,137	$44,820	$0	$253,743	$182,695	$121,797
Total	$2,313,904	$522,554	$29,747	$162,960	$504,225	$17,200	$3,550,590	$3,105,658	$2,658,178
Annualized								$268,167	$248,313

Automated Stop Announcement Costs for Large Transit Agency - Tier III (High Scenario)									
Regulatory Year	**One-Time Costs**		***Training***	**O&M Costs**		**Mid-Life Software Upgrade**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
	Bus Equipment	***Backend System***		***Bus Equipment***	***Backend System***				
Year 1	$374,308	$746,747	$37,251	$23,000	$14,006	$0	$1,195,312	$1,195,312	$1,195,312
Year 2	$374,308	$0	$1,863	$23,542	$56,025	$0	$455,737	$442,065	$423,836
Year 3	$374,308	$0	$1,863	$24,083	$56,025	$0	$456,279	$428,902	$396,963
Year 4	$374,308	$0	$1,863	$24,625	$56,025	$0	$456,821	$420,275	$374,593
Year 5	$374,308	$0	$1,863	$25,167	$56,025	$0	$457,362	$407,052	$347,595
Year 6	$374,308	$0	$1,863	$25,708	$56,025	$15,096	$473,000	$406,780	$335,830
Year 7	$374,308	$0	$1,863	$26,250	$56,025	$15,096	$473,542	$397,775	$317,273
Year 8	$374,308	$0	$1,863	$26,792	$56,025	$0	$458,987	$371,780	$284,572
Year 9	$374,308	$0	$1,863	$27,333	$56,025	$0	$459,529	$363,028	$266,527
Year 10	$374,308	$0	$1,863	$27,875	$56,025	$0	$460,071	$354,254	$248,438
Year 11	$374,308	$0	$1,863	$28,417	$56,025	$0	$460,612	$340,853	$234,912
Year 12	$374,308	$0	$1,863	$28,958	$56,025	$0	$461,154	$332,031	$221,354
Total	$4,491,696	$746,747	$57,740	$311,750	$630,281	$30,192	$6,268,405	$5,460,107	$4,647,204
Annualized								$469,435	$429,715

APPENDIX F-1: ANNUAL COSTS FOR OVER-THE-ROAD BUSES (OTRBS) UNDER PRIMARY SCENARIO

Annual Costs for Over-the-Road Buses (Primary Scenario)								
	Identification of Accessible Seating and Doorways (Signs/ISA Decals)	**Exterior Destination/Route Sign**	**Public Address System**	**Stop Request System**	**O&M Costs**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
Year 1	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$1,236,661	$1,236,661
Year 2	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$1,199,562	$1,150,095
Year 3	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$1,162,462	$1,075,895
Year 4	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$1,137,729	$1,014,062
Year 5	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$1,100,629	$939,863
Year 6	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$1,063,529	$878,030
Year 7	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$1,038,796	$828,563
Year 8	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$1,001,696	$766,730
Year 9	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$976,963	$717,264
Year 10	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$952,229	$667,797
Year 11	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$915,129	$630,697
Year 12	$131,363	$984,000	$30,750	$66,300	$24,248	$1,236,661	$890,396	$593,597
Total	$1,576,361	$11,808,000	$369,000	$795,600	$290,976	$14,839,937	$12,675,780	$10,499,256
Annualized							$1,067,352	$921,905

(***Note***: Annual compliance costs for OTRBs appear to be constant in table above due to three inter-related factors: (i) annual per-requirement and total costs are expressed in nominal dollars; (ii) the primary (medium) scenario assumes a 0% growth rate for the U.S. OTRB fleet over the regulatory timeframe; and (iii) OTRBs are assumed to incur compliance costs at a constant rate across all regulatory years.)

APPENDIX F-2: ANNUAL COSTS FOR OVER-THE-ROAD BUSES (OTRBS) UNDER LOW SCENARIO

Annual Costs for Over-the-Road Buses (Low Scenario)								
Regulatory Year	**Identification of Accessible Seating and Doorways (Signs/ISA Decals)**	**Exterior Destination/Route Sign**	**Public Address System**	**Stop Request System**	**O&M Costs**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
Year 1	$66,447	$594,560	$9,600	$48,720	$7,193	$726,520	$726,520	$726,520
Year 2	$66,193	$588,160	$9,600	$48,240	$7,122	$719,315	$697,736	$668,963
Year 3	$65,939	$582,400	$9,600	$47,760	$7,057	$712,756	$669,991	$620,098
Year 4	$65,685	$576,640	$9,000	$47,280	$6,986	$705,591	$649,144	$578,585
Year 5	$65,432	$570,240	$9,000	$46,800	$6,915	$698,387	$621,564	$530,774
Year 6	$65,142	$564,480	$9,000	$46,320	$6,849	$691,791	$594,940	$491,171
Year 7	$64,888	$558,720	$9,000	$45,840	$6,784	$685,232	$575,595	$459,105
Year 8	$64,670	$553,600	$9,000	$45,360	$6,726	$679,356	$550,279	$421,201
Year 9	$64,453	$547,840	$9,000	$44,880	$6,662	$672,835	$531,539	$390,244
Year 10	$64,199	$542,720	$9,000	$44,400	$6,603	$666,922	$513,530	$360,138
Year 11	$63,981	$537,600	$8,400	$44,160	$6,541	$660,682	$488,905	$336,948
Year 12	$63,764	$532,480	$8,400	$43,680	$6,483	$654,807	$471,461	$314,307
Total	$780,792	$6,749,440	$108,600	$553,440	$81,921	$8,274,193	$7,091,203	$5,898,054
Annualized							$599,068	$521,565

APPENDIX F-3: ANNUAL COSTS FOR OVER-THE-ROAD BUSES (OTRBS) UNDER HIGH SCENARIO

Annual Costs for Over-the-Road Buses (High Scenario)								
Regulatory Year	**Identification of Accessible Seating and Doorways (Signs/ISA Decals)**	**Exterior Destination/Route Sign**	**Public Address System**	**Stop Request System**	**O&M Costs**	**Total Cost**	**Present Value (3%)**	**Present Value (7%)**
Year 1	$213,604	$1,487,040	$61,200	$86,760	$55,458	$1,904,062	$1,904,062	$1,904,062
Year 2	$214,563	$1,501,440	$61,200	$87,480	$55,940	$1,920,623	$1,863,004	$1,786,179
Year 3	$215,642	$1,501,440	$62,100	$88,560	$56,032	$1,923,774	$1,808,347	$1,673,683
Year 4	$216,721	$1,501,440	$63,000	$89,280	$56,113	$1,926,554	$1,772,429	$1,579,774
Year 5	$217,799	$1,501,440	$63,000	$90,360	$56,178	$1,928,777	$1,716,612	$1,465,871
Year 6	$218,878	$1,501,440	$63,900	$91,080	$56,259	$1,931,557	$1,661,139	$1,371,406
Year 7	$219,957	$1,501,440	$64,800	$92,160	$56,351	$1,934,708	$1,625,155	$1,296,254
Year 8	$221,036	$1,501,440	$65,700	$92,880	$56,432	$1,937,488	$1,569,365	$1,201,242
Year 9	$222,115	$1,501,440	$65,700	$93,960	$56,496	$1,939,711	$1,532,371	$1,125,032
Year 10	$224,628	$1,501,440	$66,600	$95,040	$56,588	$1,944,296	$1,497,108	$1,049,920
Year 11	$224,272	$1,501,440	$67,500	$95,760	$56,669	$1,945,641	$1,439,775	$992,277
Year 12	$225,351	$1,501,440	$67,500	$96,840	$56,734	$1,947,865	$1,402,463	$934,975
Total	$2,634,566	$18,002,880	$772,200	$1,100,160	$675,250	$23,185,056	$19,791,830	$16,380,676
Annualized							$1,665,537	$1,436,368

APPENDIX G: SMALL BUSINESS DATA

	Total Firms	Small Firms	Other Firms	Total Receipts ($1,000s)	Receipts: Small Firms ($1,000s)	Receipts: Other Firms (%1,000s)	Avg. Receipts Per Firm: Small Firms ($1,000s)	Avg. Receipts Per Firm: Other Firms ($1,000s)	Total Payroll ($1,000s)	Payroll: Small Firms ($1,000s)	Payroll: Other Firms ($1,000s)	Avg Payroll Per Firm: Small Firms ($1,000s)	Avg Payroll Per Firm: Other Firms ($1,000s)
NAICS 485113	625	584	41	$3,073,522	$595,653	$2,477,869	$1,019.95	$60,435.83	$1,672,480	$264,503	$1,407,977	$453	$34,341
NAICS 485210	397	369	28	$1,232,040	$407,549	$824,491	$1,104.47	$29,446.11	$546,609	$125,217	$421,392	$339	$15,050
NAICS 485510	1,265	1,211	54	$2,906,334	$1,866,746	$1,039,588	$1,541.49	$19,251.63	$850,744	$524,334	$326,410	$433	$6,045
NAICS 487110	543	517	26	$929,919	$356,455	$573,464	$689.47	$22,056.31	$236,284	$105,179	$131,105	$203	$5,043
Totals =	**2,830**	**2,681**	**149**	**$8,141,815**	**$3,226,403**	**$4,915,412**	**$1,203**	**$32,989**	**$3,306,117**	**$1,019,233**	**$2,286,884**	**$380**	**$15,348**

Source: U.S. Census Bureau, Statistics of U.S. Businesses (SUSB) Main, Data Tables by Enterprise Receipt Size, United States (all industries) (Number of Firms, Estimated Receipts, and Annual Payroll by Enterprise Receipt Sizes for the United States, NAICS Sectors: 2012), available at: http://www.census.gov/econ/susb.

Data Compilation Methodology: The SUSB "Tables by Enterprise Receipt Size" data are broken down by 6-digit NAICS codes, and, within each NAICS code, by 17 bands relating to "Enterprise Receipt Size," ranging from "< 100,000" on the low end to "$100 million+" on the high end. Based on the SBA-defined "small business" size standard for the four OTRB-related NAICS codes studied in this analysis (i.e., 485113, 485210, 485510, and 487110), data were compiled for all small and non-small firms within each of the four OTRB-related NAICS codes. Specifically, data were derived for the following areas: number of small and "other" (non-small) firms; annual and average per-firm sales receipts for small and non-small firms; and annual and average per-firm payrolls for small and non-small firms. Totals within each NAICS code for these areas (see rows 2 -5 in chart above) were then summed across all NAICS codes to derive summary statistics across all OTRB-related NAICS codes. These summary statistics are presented in the "Total" line at the bottom of the chart above.

2012 NAICS Codes – OTRB-Related Codes

NAICS 485113 - Bus and Other Motor Vehicle Transit Systems
NAICS 485210 - Interurban and Rural Bus Transportation
NAICS 485510 - Charter Bus Industry
NAICS 487110 - Scenic and Sightseeing Transportation, Land

APPENDIX H: FEDERAL STATISTICS ON PREVALENCE OF CERTAIN CATEGORIES OF FUNCTIONAL DISABILITIES, U.S. NON-INSTITUTIONALIZED POPULATION

As noted below, federal agencies' respective disability-related statistical data sets do not fully align in terms of methodologies, statistical categories employed, or age ranges for surveyed populations. Unless otherwise noted, functional disability categories in tables below are taken directly from the respective federal agency data sources. Other notes, if any, concerning derivation of tabular data below are also provided below.

Census Bureau –SIPP Data (2010)

Functional Disability Category	Total Population	Percent of U.S. Population (Non-Institutionalized, ≥ 15 yrs.)
Difficulty Seeing	8,077,000	3.3%
Difficulty Hearing*	13,131,000	5.4%
Cognitive/Intellectual Disability**	2,183,000	0.9%
Ambulatory Disability***	28,339,000	11.7%

(*Source*: U.S. Census Bureau, Survey of Income and Program Participation, as cited in *Americans with Disabilities: 2010* (July 2012).)

(*Notes*: *"Difficulty hearing" category includes data compiled from separate entries for "Difficulty hearing" and "Used a hearing aid." ** "Cognitive Disability" includes data compiled from separate entries for "Intellectual disability" and "Other developmental disability. *** SIPP does not provide a functional disability category for "Ambulatory Disability." Data for this category represents combination of data from separate entries for "Difficulty walking (Severe)," "Used a wheelchair," and "Used a cane/crutches/walker.")

Census Bureau – American Community Survey Data (2014)

Functional Disability Category	Total Population	Percent of U.S. Population* (Non-Institutionalized, ≥ 18 yrs.)
Vision Difficulty	6,802,400	2.8%
Hearing Difficulty	10,799,456	4.5%
Cognitive Difficulty	12,769,520	5.3%
Ambulatory Difficulty	20,576,265	8.6%

(Source: U.S. Census Bureau, 2014 American Community Survey 1-Year Estimates.)

(*Note*: *The 2014 ACS data set provides population totals only for each functional disability category. Figures in this "Percent of U.S. Population" column calculated based on each category's respective proportion of the total civilian non-institutionalized population 18 years and older identified in the ACS data (313,890,422).)

CDC – MMWR Data (2013)

Functional Disability Category	Total Population	Percent of US Population (Non-Institutionalized, ≥ 18 yrs.)
Vision	11,148,032	4.6%
Hearing*	n/a	n/a
Cognitive	25,688,944	10.6%
Mobility	31,505,309	13.0%

(Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, as cited in *Morbidity and Mortality Weekly Report*, "Prevalence of Disability and Disability Type among Adults – United States, 2013 (July 2015))

(Note: The *MMWR* data set does not provide statistics concerning hearing-related disabilities.)

APPENDIX I: DATA SOURCES AND METHODOLOGY FOR THRESHOLD ANALYSES OF AUTOMATED ANNOUNCEMENT SYSTEMS

While the calculations used in the two threshold analyses presented in Section 6.2 are not complex, each analysis relies on data from multiple sources which, in several instances, must be estimated for purposes of use here as input values. The data sources and basic methodology underlying each of these threshold analyses are presented below. The formulae and discussion below use the following abbreviations: ASA (automated stop announcements); FR (fixed-route); PWD (persons with disabilities); UPT (unlinked passenger trips); and VOMS (vehicles operated in maximum service).

1. First Threshold Analysis: Value of Benefits to Persons with Disabilities of Automated Announcement Systems on Fixed-Route Buses on Per Trip Basis

The first threshold analysis is based on the following formula:

(Annualized ASA costs)/(# of PWD trips annually on ASA-equipped FR buses)

where the annual number of trips by persons with disabilities on ASA-equipped fixed-route buses is further estimated to be equal to:

(# FR buses equipped annually with ASA) x (Average annual UPT per FR bus) x (PWD % of total FR bus riders) x (PWD ridership premium)

Input values, sources, and any related discussions are provided in the table below.

Input	Value	Source/Discussion
Annualized ASA costs	$3,612,015	FRIA model
Number of buses equipped annually with ASA	559	Total number of ASA-equipped buses (All Tiers/All Years)/12
Average annual UPT per fixed-route bus	114,774	Estimated value based on 2014 NTD annual data for all large transit entities (see list in Appendix A). Value derived by dividing Total annual UPT for all bus modes by total annual VOMS for all bus modes.
Percentage of persons with disabilities of total fixed-route transit ridership	4.90%	Estimated value based on average ridership by persons with disabilities on all fixed-route transit modes as presented in Transp. Research Board, TCRP Report 163, Strategy Guide to Enable and Promote Use of Fixed-Route Transit by People with Disabilities, Table2-2 (2013). See FRIA, pp. 35-36 & n. 61.
Persons with Disabilities ridership premium	1.3	Estimated value based on transportation use survey conducted in 2002 by DOT's Bureau of Transportation Statistics. See FRIA, pp. 35-36 & n. 62. Survey found that, on average, persons with disabilities rode fixed-route transit buses 1.3 more times per week than bus passengers without disabilities.

2. Second Threshold Analysis: Value of Switching Ridership from Paratransit to Fixed-Route Bus Transit

The second threshold analysis is based on the following formula:

(Annualized ASA costs)/(Annual paratransit costs per person)

where annual per-person paratransit costs are further estimated to be equal to:

(Paratransit costs per trip [operating costs only]) x (Estimated # of paratransit trips annually per person)

Input values, sources, and any related discussions are provided in the table below.

Input	Value	Source/Discussion
Annualized ASA costs	$3,612,015	FRIA model
Paratransit operating costs (per trip)	$40.00	Rounded average per trip paratransit operating costs of Top 20 largest paratransit providers in the United States, based on 2013 annual NTD data. *See* Greg Sullivan, "What if 'The Ride' operated like the best big paratransit systems in the US?" (Apr. 7, 2015), http://pioneerinstitute.org/better_government/what-if-the-ride-operated-like-the-best-big-paratransit-systems-in-the-us/.
Estimated number of paratransit trips annually (per person)	400	Assumes 8 trips weekly for 50 weeks (with two weeks of vacation annually).

APPENDIX J: KEY CHARACTERISTICS OF TRANSIT AGENCIES REPORTING BUS MODES OF SERVICE (2014 NTD ANNUAL DATA)

The table below presents data compiled from the 2014 National Transit Database (NTD) for all transit agencies reporting operation of one or more buses in annual maximum service for any fixed-route bus mode of service (Bus VOMS). In addition, for each reporting transit agency, the following estimated figures are provided: (i) population of persons with disabilities (PWD) in its respective service area; and (ii) total number of unlinked passenger trips (UPT) by persons with disabilities across all of its respective fixed-route bus modes.

Based on the 2014 NTD, a total of 681 transit agencies had one or more bus operating in fixed-route bus modes. Data for each of these transit agencies is presented below in descending size order of Bus VOMS. A key at the end of this table identifies the data source(s) and methodologies used to compile or estimate, as appropriate, the tabular data.

NTD ID	Reporting Transit Agency	State	Primary UZA	Bus VOMS	Bus VOMS Category (by NTD Group)	Total Federal Capital Funds ($1000s)	Service Area Population - PWD (Estimated)*	Unlinked Passenger Trips - PWD (Estimated)*
20008	MTA New York City Transit	NY	New York-Newark, NY-NJ-CT	3,819	1,000 & Over	1,118,254.3	857,599	38,990,185
20080	New Jersey Transit Corporation	NJ	New York-Newark, NY-NJ-CT	2,047	1,000 & Over	178,547.6	1,853,481	7,900,236
90154	Los Angeles County Metropolitan Transportation Authority dba: Metro	CA	Los Angeles-Long Beach-Anaheim, CA	1,904	1,000 & Over	157,748.4	828,174	17,718,456
50066	Chicago Transit Authority	IL	Chicago, IL-IN	1,568	1,000 & Over	225,322.5	339,170	13,529,721
30030	Washington Metropolitan Area Transit Authority	DC	Washington, DC-VA-MD	1,342	1,000 & Over	222,981.9	297,565	6,843,747
30019	Southeastern Pennsylvania Transportation Authority	PA	Philadelphia, PA-NJ-DE-MD	1,212	1,000 & Over	145,288.8	413,412	9,014,144
20188	MTA Bus Company	NY	New York-Newark, NY-NJ-CT	1,089	1,000 & Over	17,697.4	778,347	6,153,481
00001	King County Department of Transportation - Metro Transit Division	WA	Seattle, WA	1,080	1,000 & Over	20,146.5	201,725	5,885,339
60008	Metropolitan Transit Authority of Harris County, Texas	TX	Houston, TX	1,054	1,000 & Over	108,344.2	369,840	3,349,833
80006	Denver Regional Transportation District	CO	Denver-Aurora, CO	834	500-999	251,184.9	276,096	3,756,236
10003	Massachusetts Bay Transportation Authority	MA	Boston, MA-NH-RI	817	500-999	330,655.9	447,369	5,861,165
30034	Maryland Transit Administration	MD	Baltimore, MD	803	500-999	162,606.8	251,218	3,910,065

NTD ID	Reporting Transit Agency	State	Primary UZA	Bus VOMS	Bus VOMS Category (by NTD Group)	Total Federal Capital Funds ($1000s)	Service Area Population - PWD (Estimated)*	Unlinked Passenger Trips - PWD (Estimated)*
50027	Metro Transit	MN	Minneapolis-St. Paul, MN-WI	769	500-999	179,485.1	184,321	3,322,901
40034	Miami-Dade Transit	FL	Miami, FL	679	500-999	12,683.2	279,601	3,790,490
50113	Pace - Suburban Bus Division	IL	Chicago, IL-IN	628	500-999	36,065.0	557,394	1,552,594
90015	San Francisco Municipal Railway	CA	San Francisco-Oakland, CA	616	500-999	298,524.1	82,825	8,021,005
30022	Port Authority of Allegheny County	PA	Pittsburgh, PA	567	500-999	41,947.9	189,643	2,616,695
60056	Dallas Area Rapid Transit	TX	Dallas-Fort Worth-Arlington, TX	544	500-999	152,940.4	217,144	1,831,769
00008	Tri-County Metropolitan Transportation District of Oregon	OR	Portland, OR-WA	516	500-999	105,312.2	191,213	2,927,742
90036	Orange County Transportation Authority	CA	Los Angeles-Long Beach-Anaheim, CA	489	250-499	19,734.1	292,008	2,396,336
90014	Alameda-Contra Costa Transit District	CA	San Francisco-Oakland, CA	472	250-499	34,991.9	141,102	2,746,869
90026	San Diego Metropolitan Transit System	CA	San Diego, CA	459	250-499	46,115.9	208,566	2,529,875
40022	Metropolitan Atlanta Rapid Transit Authority	GA	Atlanta, GA	450	250-499	63,878.1	162,973	2,929,109
90032	City of Phoenix Public Transit Department dba Valley Metro	AZ	Phoenix-Mesa, AZ	447	250-499	60,995.9	184,851	1,984,637
90002	City and County of Honolulu Department of Transportation Services	HI	Urban Honolulu, HI	431	250-499	117,495.8	108,666	3,247,987
80001	Utah Transit Authority	UT	Salt Lake City-West Valley City, UT	426	250-499	8,025.6	169,515	988,094
90013	Santa Clara Valley Transportation Authority	CA	San Jose, CA	381	250-499	142,514.2	142,947	1,610,074
50015	The Greater Cleveland Regional Transit Authority	OH	Cleveland, OH	366	250-499	43,676.5	190,639	1,936,057
60011	VIA Metropolitan Transit	TX	San Antonio, TX	360	250-499	14,936.3	244,641	2,084,336
60048	Capital Metropolitan Transportation Authority	TX	Austin, TX	339	250-499	14,331.1	89,640	1,594,839
90045	Regional Transportation Commission of Southern Nevada	NV	Las Vegas-Henderson, NV	336	250-499	17,376.1	253,091	2,926,772
50008	Milwaukee County Transit System	WI	Milwaukee, WI	334	250-499	16,261.2	115,624	2,009,699
70006	Bi-State Development Agency of the Missouri-Illinois Metropolitan District, d.b.a.(St. Louis) Metro	MO	St. Louis, MO-IL	314	250-499	48,465.8	186,340	1,474,239

NTD ID	Reporting Transit Agency	State	Primary UZA	Bus VOMS	Bus VOMS Category (by NTD Group)	Total Federal Capital Funds ($1000s)	Service Area Population - PWD (Estimated)*	Unlinked Passenger Trips - PWD (Estimated)*
50154	Metropolitan Council	MN	Minneapolis-St. Paul, MN-WI	307	250-499	7,987.4	284,971	514,419
50012	Southwest Ohio Regional Transit Authority	OH	Cincinnati, OH-KY-IN	297	250-499	2,538.5	103,127	804,881
90136	Regional Public Transportation Authority, dba: Valley Metro	AZ	Phoenix-Mesa, AZ	285	250-499	16,273.7	402,832	873,789
30051	Ride-On Montgomery County Transit	MD	Washington, DC-VA-MD	282	250-499	10,907.7	77,680	1,293,187
90009	San Mateo County Transit District	CA	San Francisco-Oakland, CA	278	250-499	16,739.0	72,973	649,164
90146	Foothill Transit	CA	Los Angeles-Long Beach-Anaheim, CA	278	250-499	44,339.6	145,520	711,586
20076	Westchester County Bee-Line System	NY	New York-Newark, NY-NJ-CT	276	250-499	682.6	95,860	1,539,282
50016	Central Ohio Transit Authority	OH	Columbus, OH	275	250-499	22,926.5	113,548	933,028
20004	Niagara Frontier Transportation Authority	NY	Buffalo, NY	269	250-499	5,992.6	165,503	1,058,517
40008	Charlotte Area Transit System	NC	Charlotte, NC-SC	268	250-499	57,769.0	104,400	1,170,472
40029	Broward County Transit Division	FL	Miami, FL	265	250-499	21,047.9	205,951	1,867,808
40035	Central Florida Regional Transportation Authority	FL	Orlando, FL	262	250-499	27,585.9	207,740	1,422,657
20206	Nassau Inter County Express	NY	New York-Newark, NY-NJ-CT	252	250-499	6,107.3	135,293	1,390,810
90147	City of Los Angeles Department of Transportation	CA	Los Angeles-Long Beach-Anaheim, CA	252	250-499	10,780.1	1,166,496	1,238,583
30083	Transportation District Commission of Hampton Roads	VA	Virginia Beach, VA	233	100-249	4,712.3	130,449	736,319
00040	Central Puget Sound Regional Transit Authority	WA	Seattle, WA	231	100-249	191,187.9	287,351	865,822
50119	City of Detroit Department of Transportation	MI	Detroit, MI	229	100-249	8,906.6	103,498	1,230,699
20122	Academy Lines, Inc.	NJ	New York-Newark, NY-NJ-CT	225	100-249	0.0	549,743	189,815
20113	Regional Transit Service, Inc. and Lift Line, Inc.	NY	Rochester, NY	221	100-249	42,515.2	72,217	842,551
10045	Connecticut Department of Transportation - CTTransit New Britain -Dattco.	CT	Hartford, CT	213	100-249	0.0	9,021	735,102
90033	City of Tucson	AZ	Tucson, AZ	211	100-249	14,145.2	80,512	965,959

NTD ID	Reporting Transit Agency	State	Primary UZA	Bus VOMS	Bus VOMS Category (by NTD Group)	Total Federal Capital Funds ($1000s)	Service Area Population - PWD (Estimated)*	Unlinked Passenger Trips - PWD (Estimated)*
30068	Fairfax Connector Bus System	VA	Washington, DC-VA-MD	208	100-249	0.0	84,515	522,096
50031	Suburban Mobility Authority for Regional Transportation	MI	Detroit, MI	205	100-249	7,688.0	541,443	453,181
10001	Rhode Island Public Transit Authority	RI	Providence, RI-MA	191	100-249	5,199.7	149,910	969,222
00029	Snohomish County Public Transportation Benefit Area Corporation	WA	Seattle, WA	189	100-249	2,848.0	70,598	425,944
30075	Delaware Transit Corporation	DE	Philadelphia, PA-NJ-DE-MD	188	100-249	25,921.4	113,867	486,760
90166	LACMTA - Small Operators	CA	Los Angeles-Long Beach-Anaheim, CA	188	100-249	4,243.6	341,296	519,988
90023	Long Beach Transit	CA	Los Angeles-Long Beach-Anaheim, CA	185	100-249	3,769.5	76,800	1,395,547
40027	Pinellas Suncoast Transit Authority	FL	Tampa-St. Petersburg, FL	182	100-249	1,052.9	113,151	695,032
20002	Capital District Transportation Authority	NY	Albany-Schenectady, NY	180	100-249	8,332.4	98,042	788,928
50005	Metro Transit System	WI	Madison, WI	179	100-249	9,427.5	24,042	745,974
70005	Kansas City Area Transportation Authority	MO	Kansas City, MO-KS	179	100-249	13,350.7	94,300	776,721
40018	Transit Authority of River City	KY	Louisville/Jefferson County, KY-IN	177	100-249	19,606.6	116,999	711,372
40041	Hillsborough Area Regional Transit Authority	FL	Tampa-St. Petersburg, FL	162	100-249	6,142.9	116,455	737,795
20126	Hudson Transit Lines, Inc.	NJ	New York-Newark, NY-NJ-CT	161	100-249	0.0	549,743	224,290
90019	Sacramento Regional Transit District	CA	Sacramento, CA	160	100-249	47,549.8	132,580	669,226
90016	Golden Gate Bridge, Highway and Transportation District	CA	San Francisco-Oakland, CA	159	100-249	16,217.0	86,031	312,854
40040	Jacksonville Transportation Authority	FL	Jacksonville, FL	158	100-249	15,485.7	131,997	540,853
90008	Santa Monica's Big Blue Bus	CA	Los Angeles-Long Beach-Anaheim, CA	152	100-249	17,172.7	44,017	922,057
90031	Riverside Transit Agency	CA	Riverside-San Bernardino, CA	149	100-249	10,244.7	168,335	448,931
90029	Omnitrans	CA	Riverside-San Bernardino, CA	144	100-249	45,103.2	146,916	740,837
10008	Pioneer Valley Transit Authority	MA	Springfield, MA-CT	141	100-249	9,703.0	81,628	559,801
40004	Metropolitan Transit Authority	TN	Nashville-Davidson, TN	137	100-249	2,118.1	70,188	451,454

NTD ID	Reporting Transit Agency	State	Primary UZA	Bus VOMS	Bus VOMS Category (by NTD Group)	Total Federal Capital Funds ($1000s)	Service Area Population - PWD (Estimated)*	Unlinked Passenger Trips - PWD (Estimated)*
90030	North County Transit District	CA	San Diego, CA	137	100-249	10,290.4	79,845	398,631
50033	Interurban Transit Partnership	MI	Grand Rapids, MI	135	100-249	14,949.7	57,929	591,198
50050	Indianapolis and Marion County Public Transportation	IN	Indianapolis, IN	133	100-249	3,369.9	116,035	504,338
60019	City of Albuquerque Transit Department	NM	Albuquerque, NM	131	100-249	18,808.7	87,997	637,443
20072	Suffolk County Department of Public Works - Transportation Division	NY	New York-Newark, NY-NJ-CT	130	100-249	2,513.2	151,800	276,961
40037	Board of County Commissioners, Palm Beach County, PalmTran, Inc.	FL	Miami, FL	130	100-249	7,807.1	142,104	559,913
60007	Fort Worth Transportation Authority	TX	Dallas-Fort Worth-Arlington, TX	130	100-249	11,414.8	76,724	372,523
30006	Greater Richmond Transit Company	VA	Richmond, VA	124	100-249	21,301.3	52,600	415,358
60006	Mass Transit Department - City of El Paso	TX	El Paso, TX-NM	124	100-249	29,863.8	114,038	599,121
20018	CNY Centro, Inc.	NY	Syracuse, NY	121	100-249	3,246.0	64,916	454,728
00003	Pierce County Transportation Benefit Area Authority	WA	Seattle, WA	120	100-249	7,105.5	55,707	501,331
50017	Greater Dayton Regional Transit Authority	OH	Dayton, OH	120	100-249	7,123.4	77,710	514,510
30070	Potomac and Rappahannock Transportation Commission	VA	Washington, DC-VA-MD	119	100-249	7,398.7	36,328	155,530
40003	Memphis Area Transit Authority	TN	Memphis, TN-MS-AR	119	100-249	12,542.0	96,658	392,387
00002	Spokane Transit Authority	WA	Spokane, WA	112	100-249	4,538.0	66,711	554,897
50010	METRO Regional Transit Authority	OH	Akron, OH	112	100-249	9,054.5	67,728	254,988
50211	Rides Mass Transit District	IL	Carbondale, IL	112	100-249	1,034.3	34,382	31,166
20128	Suburban Transit Corporation	NJ	New York-Newark, NY-NJ-CT	110	100-249	0.0	549,743	136,872
40086	Metropolitan Bus Authority	PR	San Juan, PR	109	100-249	153.4	254,225	413,295
70010	Des Moines Area Regional Transit Authority	IA	Des Moines, IA	108	100-249	680.1	39,366	211,171
70002	Transit Authority of Omaha	NE	Omaha, NE-IA	107	100-249	5,555.7	58,440	198,137
40030	Gainesville Regional Transit System	FL	Gainesville, FL	104	100-249	20,949.3	15,040	529,907

NTD ID	Reporting Transit Agency	State	Primary UZA	Bus VOMS	Bus VOMS Category (by NTD Group)	Total Federal Capital Funds ($1000s)	Service Area Population - PWD (Estimated)*	Unlinked Passenger Trips - PWD (Estimated)*
40135	Georgia Regional Transportation Authority	GA	Atlanta, GA	101	100-249	113.1	130,068	82,934
10055	Connecticut Department of Transportation - CTTRANSIT New Haven Division	CT	New Haven, CT	97	50-99	2,007.5	57,913	466,808
50060	Champaign-Urbana Mass Transit District	IL	Champaign, IL	95	50-99	0.0	11,601	643,723
00024	Clark County Public Transportation Benefit Area Authority	WA	Portland, OR-WA	94	50-99	4,733.2	46,669	297,006
50032	Mass Transportation Authority	MI	Flint, MI	92	50-99	844.2	66,945	252,279
90078	Central Contra Costa Transit Authority	CA	Concord, CA	89	50-99	2,632.5	47,472	163,099
90020	Santa Barbara Metropolitan Transit District	CA	Santa Barbara, CA	87	50-99	131.8	28,161	373,568
00007	Lane Transit District	OR	Eugene, OR	86	50-99	9,399.1	47,303	549,246
00020	Kitsap Transit	WA	Bremerton, WA	86	50-99	2,399.7	41,693	138,099
20149	Rockland Coaches, Inc.	NJ	New York-Newark, NY-NJ-CT	84	50-99	0.0	549,743	128,097
30081	Loudoun County Commuter Bus Service - Office of Transportation Services	VA	Washington, DC-VA-MD	84	50-99	0.0	26,283	86,090
60032	New Orleans Regional Transit Authority	LA	New Orleans, LA	83	50-99	5,354.1	46,895	554,773
90006	Santa Cruz Metropolitan Transit District	CA	Santa Cruz, CA	83	50-99	3,615.7	21,127	270,150
40019	Transit Authority of Northern Kentucky	KY	Cincinnati, OH-KY-IN	82	50-99	5,523.1	33,996	171,127
50022	Toledo Area Regional Transit Authority	OH	Toledo, OH-MI	82	50-99	243.0	58,313	141,695
40110	Charleston Area Regional Transportation Authority	SC	Charleston-North Charleston, SC	81	50-99	1,874.1	58,123	237,354
90012	San Joaquin Regional Transit District	CA	Stockton, CA	81	50-99	23,551.2	90,448	216,091
50036	Capital Area Transportation Authority	MI	Lansing, MI	80	50-99	7,788.8	37,675	542,407
90027	Fresno Area Express	CA	Fresno, CA	80	50-99	5,052.2	71,670	590,893
20217	Hampton Jitney, Inc.	NY	New York-Newark, NY-NJ-CT	78	50-99	0.0	1,000,789	40,976
30085	Prince George's County Transit	MD	Washington, DC-VA-MD	75	50-99	0.0	69,040	186,518
90062	Monterey-Salinas Transit	CA	Seaside-Monterey, CA	75	50-99	1,148.5	56,525	199,452
70041	Ames Transit Agency dba CyRide	IA	Atlanta, GA	74	50-99	1,182.0	3,718	323,852

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40078	Cobb County Department of Transportation Authority	GA	St. Louis, MO-IL	74	50-99	2,054.8	66,055	171,379
50146	Madison County Transit District	IL	Ames, IA	74	50-99	1,818.4	28,108	129,532
40051	Chapel Hill Transit	NC	Durham, NC	73	50-99	141.2	7,781	338,296
50040	Ann Arbor Area Transportation Authority	MI	Ann Arbor, MI	73	50-99	3,766.0	19,337	317,969
30010	Lehigh and Northampton Transportation Authority	PA	Allentown, PA-NJ	70	50-99	8,062.1	53,682	245,919
60059	Brazos Transit District	TX	College Station-Bryan, TX	70	50-99	0.0	11,395	60,831
40108	Research Triangle Regional Public Transportation Authority	NC	Durham, NC	68	50-99	86.0	136,074	89,320
90171	Santa Clarita Transit	CA	Santa Clarita, CA	67	50-99	10,461.8	14,202	168,068
30014	Cumberland Dauphin-Harrisburg Transit Authority	PA	Harrisburg, PA	65	50-99	5,442.8	62,938	130,733
40007	Capital Area Transit	NC	Raleigh, NC	65	50-99	590.1	28,862	303,148
40042	Birmingham-Jefferson County Transit Authority	AL	Birmingham, AL	65	50-99	3,198.8	62,841	158,153
40179	Broward County Community Bus Service	FL	Miami, FL	65	50-99	0.0	205,951	131,916
90004	Golden Empire Transit District	CA	Bakersfield, CA	65	50-99	3,864.6	56,401	296,264
90041	Montebello Bus Lines	CA	Los Angeles-Long Beach-Anaheim, CA	65	50-99	1,411.8	30,247	388,814
90121	Antelope Valley Transit Authority	CA	Lancaster-Palmdale, CA	65	50-99	2,444.2	35,603	176,711
60051	Corpus Christi Regional Transportation Authority	TX	Corpus Christi, TX	64	50-99	4,492.6	48,845	276,883
30013	Erie Metropolitan Transit Authority	PA	Erie, PA	63	50-99	5,683.8	29,620	157,273
30071	City of Alexandria	VA	Washington, DC-VA-MD	60	50-99	4,070.5	11,197	207,700
60010	City Transit Management Company, Inc.	TX	Lubbock, TX	60	50-99	302.3	33,230	194,464
00019	Intercity Transit	WA	Olympia-Lacey, WA	59	50-99	5,154.5	20,491	219,046
20163	Lakeland Bus Lines, Inc.	NJ	New York-Newark, NY-NJ-CT	59	50-99	0.0	549,743	76,891
40002	Knoxville Area Transit	TN	Knoxville, TN	59	50-99	4,254.3	27,857	136,271

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40138	Gwinnett County Board of Commissioners	GA	Atlanta, GA	59	50-99	993.6	77,311	82,864
30054	Centre Area Transportation Authority	PA	State College, PA	58	50-99	1,630.7	9,791	360,279
40036	City of Tallahassee	FL	Tallahassee, FL	58	50-99	3,452.2	17,692	208,756
60022	Capital Area Transit System	LA	Baton Rouge, LA	58	50-99	5,446.9	50,122	190,059
20161	DeCamp Bus Lines	NJ	New York-Newark, NY-NJ-CT	57	50-99	0.0	550	91,820
60018	Metropolitan Tulsa Transit Authority	OK	Tulsa, OK	57	50-99	2,370.1	52,000	153,473
90001	Regional Transportation Commission of Washoe County	NV	Reno, NV-CA	57	50-99	4,174.7	39,004	400,101
30027	York County Transportation Authority	PA	York, PA	55	50-99	2,008.4	54,209	82,525
90211	Anaheim Transportation Network	CA	Los Angeles-Long Beach-Anaheim, CA	55	50-99	496.3	33,600	441,516
00025	Salem Area Mass Transit District	OR	Salem, OR	54	50-99	1,191.7	37,388	162,810
10066	Chittenden County Transportation Authority	VT	Burlington, VT	54	50-99	1,764.7	13,580	124,250
40017	Lexington Transit Authority	KY	Lexington-Fayette, KY	54	50-99	742.6	33,426	232,984
40032	County of Volusia, dba: VOTRAN	FL	Palm Coast-Daytona Beach-Port Orange, FL	54	50-99	4,686.4	86,059	182,736
20169	Trans-Bridge Lines, Inc.	PA	New York-Newark, NY-NJ-CT	53	50-99	0.0	549,743	59,968
30012	Cambria County Transit Authority	PA	Johnstown, PA	53	50-99	12,996.7	15,297	56,609
40046	Sarasota County Area Transit	FL	Sarasota-Bradenton, FL	53	50-99	5,899.1	59,061	140,846
10006	Southeastern Regional Transit Authority	MA	New Bedford, MA	52	50-99	3,382.4	28,383	115,663
20084	Transport of Rockland	NY	New York-Newark, NY-NJ-CT	52	50-99	1,146.6	32,710	144,463
20166	Orange-Newark-Elizabeth, Inc.	NJ	New York-Newark, NY-NJ-CT	52	50-99	0.0	549,743	477,868
40025	Chatham Area Transit Authority	GA	Savannah, GA	52	50-99	3,757.1	32,876	176,017
00018	Ben Franklin Transit	WA	Kennewick-Pasco, WA	51	50-99	4,707.4	27,577	138,382
50025	Duluth Transit Authority	MN	Duluth, MN-WI	51	50-99	5,509.6	17,368	152,258
70001	StarTran	NE	Lincoln, NE	51	50-99	2,247.1	27,683	119,389
90079	SunLine Transit Agency	CA	Indio-Cathedral City, CA	51	50-99	5,874.8	55,921	229,530
20132	New Jersey Transit Corporation-45	NJ	New York-Newark, NY-NJ-CT	50	50-99	0.0	549,743	277,430

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50051	Greater Lafayette Public Transportation Corporation	IN	Lafayette, IN	50	50-99	1,853.5	15,314	257,110
60017	Central Oklahoma Transportation and Parking Authority	OK	Oklahoma City, OK	50	50-99	3,909.7	92,331	140,086
20190	Port Imperial Ferry Corporation dba NY Waterway	NJ	New York-Newark, NY-NJ-CT	49	25-49	0.0	369,504	148,215
40028	Lee County Transit	FL	Cape Coral, FL	49	25-49	19,333.2	65,882	193,211
60033	Central Arkansas Transit Authority	AR	Little Rock, AR	49	25-49	961.1	24,744	134,309
90144	Livermore / Amador Valley Transit Authority	CA	Concord, CA	49	25-49	403.5	18,151	80,955
10057	Norwalk Transit District	CT	Bridgeport-Stamford, CT-NY	48	25-49	1,124.6	9,892	94,524
50059	Springfield Mass Transit District	IL	Springfield, IL	48	25-49	6,348.7	17,627	89,519
90010	Torrance Transit System	CA	Los Angeles-Long Beach-Anaheim, CA	48	25-49	954.2	58,257	196,021
30001	Kanawha Valley Regional Transportation Authority	WV	Charleston, WV	47	25-49	3,309.2	37,694	132,988
50003	Kenosha Transit	WI	Kenosha, WI-IL	46	25-49	0.0	16,997	61,635
50029	Bay Metropolitan Transit Authority	MI	Bay City, MI	46	25-49	0.0	19,367	24,318
70035	Johnson County Kansas, aka: Johnson County Transit	KS	Kansas City, MO-KS	46	25-49	1,025.3	49,251	25,083
90007	Modesto Area Express	CA	Modesto, CA	46	25-49	1,328.6	34,491	177,913
90162	The Eastern Contra Costa Transit Authority	CA	Antioch, CA	46	25-49	134.3	40,392	138,781
10064	Greater Attleboro-Taunton Regional Transit Authority	MA	Providence, RI-MA	45	25-49	3,927.9	14,039	45,961
40087	Durham Area Transit Authority	NC	Durham, NC	45	25-49	495.5	23,282	309,412
50056	Greater Peoria Mass Transit District	IL	Peoria, IL	45	25-49	366.6	26,237	163,210
90035	Gold Coast Transit	CA	Oxnard, CA	45	25-49	876.4	40,766	187,070
00012	Municipality of Anchorage - Public Transportation Department	AK	Anchorage, AK	44	25-49	1,938.5	26,467	189,200
00021	Whatcom Transportation Authority	WA	Bellingham, WA	44	25-49	1,872.6	31,527	290,061
10004	Brockton Area Transit Authority	MA	Boston, MA-NH-RI	44	25-49	3,879.7	27,247	139,752
30024	Berks Area Regional Transportation Authority	PA	Reading, PA	44	25-49	1,084.5	61,716	158,083

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40001	Chattanooga Area Regional Transportation Authority	TN	Chattanooga, TN-GA	44	25-49	6,706.1	21,965	128,509
90205	City of Elk Grove	CA	Sacramento, CA	44	25-49	0.0	20,568	50,343
20145	Tompkins Consolidated Area Transit	NY	Boston, MA-NH-RI	43	25-49	3,119.8	7,046	210,545
10005	Lowell Regional Transit Authority	MA	Boston, MA-NH-RI	43	25-49	1,827.4	36,186	73,313
10013	Merrimack Valley Regional Transit Authority	MA	Worcester, MA-CT	43	25-49	17,729.1	32,778	102,287
10014	Worcester Regional Transit Authority	MA	Bridgeport-Stamford, CT-NY	43	25-49	1,234.3	59,437	183,047
10050	Greater Bridgeport Transit Authority	CT	Ithaca, NY	43	25-49	166.4	26,484	298,055
40180	University of Georgia Transit System	GA	Athens-Clarke County, GA	43	25-49	1,319.1	4,532	521,362
50057	Rock Island County Metropolitan Mass Transit District	IL	Davenport, IA-IL	43	25-49	6,938.7	13,242	171,543
90039	Culver City Municipal Bus Lines	CA	Los Angeles-Long Beach-Anaheim, CA	43	25-49	2,845.1	32,805	296,371
90042	City of Gardena Transportation Department	CA	Los Angeles-Long Beach-Anaheim, CA	43	25-49	84.7	44,541	180,768
10056	Connecticut Department of Transportation - CTTRANSIT Stamford Division	CT	Bridgeport-Stamford, CT-NY	42	25-49	86.3	25,601	173,319
30102	Martz Trailways	PA	New York-Newark, NY-NJ-CT	42	25-49	0.0	82,203	47,762
80011	Transfort	CO	Fort Collins, CO	42	25-49	17,309.7	13,535	127,970
40093	Greensboro Transit Authority	NC	Greensboro, NC	41	25-49	112.1	27,776	217,065
60101	Denton County Transportation Authority	TX	Denton-Lewisville, TX	41	25-49	4,116.7	19,468	109,105
90089	Sonoma County Transit	CA	Santa Rosa, CA	41	25-49	3,506.5	56,012	64,490
90090	Yolo County Transportation District	CA	Sacramento, CA	41	25-49	80.4	67,697	83,281
90148	Victor Valley Transit Authority	CA	Victorville-Hesperia, CA	41	25-49	2,314.0	40,199	88,985
00011	Valley Regional Transit	ID	Boise City, ID	40	25-49	4,714.1	34,619	69,014
30076	Williamsburg Area Transit Authority	VA	Williamsburg, VA	40	25-49	585.5	7,638	121,710
20003	Broome County Department of Public Transportation	NY	Binghamton, NY-PA	39	25-49	2,955.5	30,692	115,450
30080	Arlington Transit - Arlington County	VA	Washington, DC-VA-MD	39	25-49	1,309.5	16,800	139,014

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50158	University of Michigan Parking and Transportation Services	MI	Ann Arbor, MI	39	25-49	0.0	5,824	357,621
70015	Wichita Transit	KS	Wichita, KS	38	25-49	3,848.1	45,122	91,350
70048	City of Lawrence	KS	Lawrence, KS	38	25-49	8.6	7,187	148,261
10105	Cape Cod Regional Transit Authority	MA	Barnstable Town, MA	37	25-49	1,383.7	29,178	32,933
50092	City of Rochester Public Transportation	MN	Rochester, MN	37	25-49	1,629.6	10,840	81,728
40012	Winston-Salem Transit Authority - Trans-Aid of Forsyth County	NC	Winston-Salem, NC	36	25-49	3,113.2	24,146	160,424
50052	South Bend Public Transportation Corporation	IN	South Bend, IN-MI	36	25-49	7,500.5	21,917	104,250
60024	Shreveport Area Transit System	LA	Shreveport, LA	36	25-49	629.2	40,732	154,917
90092	City of Fairfield - Fairfield and Suisun Transit	CA	Fairfield, CA	36	25-49	242.3	16,309	52,381
90142	Unitrans - City of Davis/ASUCD	CA	Davis, CA	36	25-49	1,841.1	3,558	193,014
90159	Western Contra Costa Transit Authority	CA	San Francisco-Oakland, CA	36	25-49	6,372.6	6,428	64,284
30007	Greater Roanoke Transit Company	VA	Roanoke, VA	35	25-49	2,571.5	14,458	115,770
50011	Stark Area Regional Transit Authority	OH	Canton, OH	35	25-49	3,759.0	54,763	130,430
50024	Western Reserve Transit Authority	OH	Youngstown, OH-PA	35	25-49	1,725.3	37,973	76,562
60009	Laredo Transit Management, Inc.	TX	Laredo, TX	35	25-49	15.1	29,747	156,022
90193	Chula Vista Transit	CA	San Diego, CA	35	25-49	0.0	22,928	153,913
10128	Connecticut Department of Transportation-CTTransit Waterbury-NET	CT	Waterbury, CT	34	25-49	287.0	24,122	135,928
30018	Red Rose Transit Authority	PA	Lancaster, PA	33	25-49	976.8	56,824	92,504
30091	Blacksburg Transit	VA	Blacksburg, VA	33	25-49	5,014.6	5,857	179,014
80005	Mountain Metropolitan Transit	CO	Colorado Springs, CO	33	25-49	1,928.5	65,384	143,817
90091	City of Visalia - Visalia City Coach	CA	Visalia, CA	33	25-49	727.3	15,970	83,700
00005	Everett Transit	WA	Seattle, WA	32	25-49	0.0	10,464	96,585
20135	Monsey New Square Trails Corporation	NY	New York-Newark, NY-NJ-CT	32	25-49	0.0	28,944	31,292
30025	County of Lackawanna Transit System	PA	Scranton, PA	32	25-49	1,692.9	66,381	56,258
40031	Lakeland Area Mass Transit District	FL	Lakeland, FL	32	25-49	1,026.5	20,880	74,056
50001	City of Appleton - Valley Transit	WI	Appleton, WI	32	25-49	22.7	23,345	54,621

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50006	Belle Urban System - Racine	WI	Racine, WI	32	25-49	0.0	15,021	70,864
50096	City of Waukesha Transit Commission	WI	Milwaukee, WI	32	25-49	77.1	17,280	55,364
30015	Luzerne County Transportation Authority	PA	Scranton, PA	31	25-49	131.3	35,235	58,204
30044	Westmoreland County Transit Authority	PA	Pittsburgh, PA	31	25-49	3,150.1	39,673	26,836
30094	City of Harrisonburg Department of Public Transportation	VA	Harrisonburg, VA	31	25-49	4,601.3	5,248	135,904
40038	Escambia County Area Transit	FL	Pensacola, FL-AL	31	25-49	1,346.9	48,872	74,316
50028	St. Cloud Metropolitan Transit Commission	MN	St. Cloud, MN	31	25-49	4,173.3	12,156	108,099
90088	Napa County Transportation and Planning Agency	CA	Napa, CA	31	25-49	2,151.7	15,318	37,395
90232	Solano County Transit	CA	Vallejo, CA	31	25-49	398.1	27,861	70,469
50044	Fort Wayne Public Transportation Corporation	IN	Fort Wayne, IN	30	25-49	730.3	36,782	97,855
90134	Peninsula Corridor Joint Powers Board dba: Caltrain	CA	San Francisco-Oakland, CA	30	25-49	38,968.2	365,346	46,178
90164	Ventura Intercity Service Transit Authority	CA	Oxnard, CA	30	25-49	0.0	22,194	40,327
40058	City of Rome Transit Department	GA	Rome, GA	29	25-49	716.1	6,147	51,068
40063	Space Coast Area Transit	FL	Palm Bay-Melbourne, FL	29	25-49	3,118.2	78,718	114,028
40147	North Carolina State University Transportation Department	NC	Raleigh, NC	29	25-49	0.0	3,735	142,953
50058	Rockford Mass Transit District	IL	Rockford, IL	29	25-49	289.8	43,045	87,415
50110	Bloomington Public Transportation Corporation	IN	Bloomington, IN	29	25-49	2,386.9	8,121	172,013
60088	Jefferson Parish Department of Transit Administration	LA	New Orleans, LA	29	25-49	371.3	54,739	103,212
90173	Transit Joint Powers Authority for Merced County	CA	Merced, CA	29	25-49	0.0	24,480	40,425
00043	Link Transit	WA	Wenatchee, WA	28	25-49	360.6	13,800	48,381
40141	Central Midlands Transit	SC	Columbia, SC	28	25-49	0.0	29,464	75,223
50021	Portage Area Regional Transportation Authority	OH	Akron, OH	28	25-49	388.6	20,187	69,999

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50035	Kalamazoo Metro Transit System	MI	Kalamazoo, MI	28	25-49	1,834.7	29,778	148,346
50039	Saginaw Transit Authority Regional Service	MI	Saginaw, MI	28	25-49	83.5	22,479	47,412
70016	City of Columbia	MO	Columbia, MO	28	25-49	608.7	11,621	107,184
80002	Su Tran LLC dba: Sioux Area Metro	SD	Sioux Falls, SD	28	25-49	30.9	15,552	46,812
10118	MetroWest Regional Transit Authority	MA	Boston, MA-NH-RI	27	25-49	3,714.0	24,738	23,317
30002	The Tri-State Transit Authority	WV	Huntington, WV-KY-OH	27	25-49	1,945.7	41,338	43,507
30008	Greater Lynchburg Transit Company	VA	Lynchburg, VA	27	25-49	6,203.2	9,459	121,932
50054	Muncie Indiana Transit System	IN	Muncie, IN	27	25-49	1,059.5	10,933	90,885
60090	Lower Rio Grande Valley Development Council	TX	McAllen, TX	27	25-49	2,882.4	90,374	19,232
10051	Housatonic Area Regional Transit	CT	Danbury, CT-NY	26	25-49	1,115.0	12,698	41,160
10122	Jalbert Leasing, Inc. dba C&J	NH	Portsmouth, NH-ME	26	25-49	0.0	64,320	32,361
20010	Dutchess County Division of Mass Transportation	NY	Poughkeepsie-Newburgh, NY-NJ	26	25-49	3,242.1	42,240	22,710
20177	Adirondack Transit Lines, Inc,	NY	New York-Newark, NY-NJ-CT	26	25-49	0.0	952,230	29,473
40112	City of San Juan	PR	San Juan, PR	26	25-49	0.0	82,497	61,708
70019	University of Iowa	IA	Iowa City, IA	26	25-49	1,544.2	4,782	230,834
90208	Butte County Association of Governments	CA	Chico, CA	26	25-49	865.5	22,420	66,869
10119	University Of New Hampshire - University Transportation Services	NH	Dover-Rochester, NH-ME	25	25-49	174.8	14,172	60,874
20082	New York City Department of Transportation	NY	New York-Newark, NY-NJ-CT	25	25-49	69,645.0	855,270	27,912
20210	County of Morris	NJ	New York-Newark, NY-NJ-CT	25	25-49	0.0	49,993	2,509
20211	County of Mercer	NJ	Trenton, NJ	25	25-49	0.0	45,149	5,520
30036	Charlottesville Area Transit	VA	Charlottesville, VA	25	25-49	1,906.5	9,262	111,500
40006	Cape Fear Public Transportation Authority	NC	Wilmington, NC	25	25-49	4,276.1	19,660	71,306
40015	City of Jackson, Department of Planning and Development, Transit Services Division	MS	Jackson, MS	25	25-49	2,718.1	20,128	31,120
50002	Green Bay Metro	WI	Green Bay, WI	25	25-49	40.5	20,742	70,031

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50117	Laketran	OH	Cleveland, OH	25	25-49	2,104.5	31,034	24,290
60014	City of Brownsville - Brownsville Metro	TX	Brownsville, TX	25	25-49	1,932.4	21,278	85,897
40206	Berkeley Charleston Dorchester RTMA	SC	Charleston-North Charleston, SC	24	10-24	128.3	71,113	5,092
50043	Metropolitan Evansville Transit System	IN	Evansville, IN-KY	24	10-24	901.7	19,305	101,381
50047	Bloomington-Normal Public Transit System	IL	Bloomington-Normal, IL	24	10-24	408.8	12,782	123,576
90061	Yuba-Sutter Transit Authority	CA	Yuba City, CA	24	10-24	3,337.0	19,596	58,982
30026	Williamsport Bureau of Transportation	PA	New York-Newark, NY-NJ-CT	23	10-24	0.0	12,418	64,561
90149	City of Lompoc - Lompoc Transit	CA	Williamsport, PA	23	10-24	5,474.8	6,513	15,196
90206	San Luis Obispo Regional Transit Authority	CA	Mobile, AL	23	10-24	871.9	17,305	50,456
20160	Community Transit, Inc.	NJ	Greensboro, NC	23	10-24	1,414.5	549,743	26,841
40043	The Wave Transit System	AL	Santa Rosa, CA	23	10-24	2,303.8	29,973	58,626
40173	Piedmont Authority for Regional Transportation	NC	Lompoc, CA	23	10-24	0.0	151,589	23,560
90017	City of Santa Rosa	CA	San Luis Obispo, CA	23	10-24	1,904.0	19,081	114,583
90241	County of Maui - Dept. of Transportation	HI	Kahului, HI	23	10-24	1,519.7	16,113	116,742
10016	Greater Portland Transit District	ME	Portland, ME	22	10-24	2,089.0	11,575	72,967
10133	Boston Express Bus, Inc.	NH	Boston, MA-NH-RI	22	10-24	27.8	49,275	28,593
20185	Centro of Oneida, Inc.	NY	Utica, NY	22	10-24	482.8	25,436	60,938
30011	Altoona Metro Transit	PA	Altoona, PA	22	10-24	193.1	12,599	30,873
30089	Monongalia County Urban Mass Transit Authority	WV	Morgantown, WV	22	10-24	1,735.2	10,073	59,356
40047	Athens Transit System	GA	Athens-Clarke County, GA	22	10-24	489.1	12,022	80,468
40077	South Florida Regional Transportation Authority	FL	Miami, FL	22	10-24	21,744.2	616,266	49,052
40125	Municipality of Carolina	PR	San Juan, PR	22	10-24	172.0	38,181	40,023
40130	Macon-Bibb County Transit Authority	GA	Macon, GA	22	10-24	723.4	23,799	49,288
50061	Decatur Public Transit System	IL	Decatur, IL	22	10-24	68.5	12,038	71,539
60077	Santa Fe Trails - City of Santa Fe	NM	Santa Fe, NM	22	10-24	416.3	9,037	52,219
70008	Cedar Rapids Transit	IA	Cedar Rapids, IA	22	10-24	5,742.2	15,889	61,537
70014	Topeka Metropolitan Transit Authority	KS	Topeka, KS	22	10-24	385.0	19,376	59,013

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80003	City of Fargo, DBA: Metropolitan Area Transit	ND	Fargo, ND-MN	22	10-24	145.6	13,549	85,335
90119	Laguna Beach Municipal Transit	CA	Mission Viejo-Lake Forest-San Clemente, CA	22	10-24	0.0	1,750	33,213
00006	Yakima Transit	WA	Yakima, WA	21	10-24	313.5	15,714	56,802
40044	City of Montgomery-Montgomery Area Transit System	AL	Montgomery, AL	21	10-24	8.0	31,482	44,510
40094	Alternativa de Transporte Integrado - ATI	PR	San Juan, PR	21	10-24	0.0	151,495	76,845
40102	Waccamaw Regional Transportation Authority	SC	Myrtle Beach-Socastee, SC-NC	21	10-24	601.8	43,922	22,493
40115	Municipality of Caguas Mobility Office	PR	San Juan, PR	21	10-24	653.4	43,200	11,604
60107	Texoma Area Paratransit System, Inc	TX	Sherman, TX	21	10-24	2,901.4	127,908	8,759
70003	City Utilities of Springfield	MO	Springfield, MO	21	10-24	1,215.7	25,140	86,069
70012	Sioux City Transit System	IA	Sioux City, IA-NE-SD	21	10-24	239.5	13,099	53,639
70018	Iowa City Transit	IA	Iowa City, IA	21	10-24	243.3	4,619	91,867
90234	Marin County Transit District	CA	San Francisco-Oakland, CA	21	10-24	323.0	25,578	34,127
00044	Skagit Transit	WA	Mount Vernon, WA	20	10-24	356.6	13,322	40,951
00057	Central Oregon Intergovernmental Council	OR	Bend, OR	20	10-24	0.0	12,282	24,626
30023	Beaver County Transit Authority	PA	Pittsburgh, PA	20	10-24	3,141.0	22,852	42,796
30079	Fredericksburg Regional Transit	VA	Fredericksburg, VA	20	10-24	1,747.3	11,372	24,280
40026	Manatee County Area Transit	FL	Sarasota-Bradenton, FL	20	10-24	1,905.1	49,071	89,382
40100	Santee Wateree Regional Transportation Authority	SC	Sumter, SC	20	10-24	545.3	55,155	7,907
80004	Billings Metropolitan Transit	MT	Billings, MT	20	10-24	79.3	12,625	30,416
00034	Rogue Valley Transportation District	OR	Medford, OR	19	10-24	1,477.1	22,312	68,524
10061	Montachusett Regional Transit Authority	MA	Leominster-Fitchburg, MA	19	10-24	4,355.0	41,638	36,855
40174	Municipality of Yauco	PR	Yauco, PR	19	10-24	324.4	10,679	5,192
40208	City of Clemson/ Clemson Area Transit	SC	Greenville, SC	19	10-24	540.0	3,764	78,127
60103	Fort Bend County Public Transportation	TX	Houston, TX	19	10-24	603.4	60,018	13,461

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90022	Norwalk Transit System	CA	Los Angeles-Long Beach-Anaheim, CA	19	10-24	979.0	61,187	85,244
90087	Santa Maria Area Transit	CA	Santa Maria, CA	19	10-24	2,424.4	11,770	43,734
90196	Placer County Department of Public Works	CA	Sacramento, CA	19	10-24	0.0	45,755	37,279
90233	Yuma County Intergovernmental Public Transportation Authority	AZ	Yuma, AZ-CA	19	10-24	114.4	27,405	22,804
30061	Mid Mon Valley Transit Authority	PA	Norwich-New London, CT-RI	18	10-24	14.4	11,697	16,620
10040	Southeast Area Transit	CT	Boston, MA-NH-RI	18	10-24	0.0	30,479	57,106
10117	Plymouth & Brockton Street Railway Company	MA	New York-Newark, NY-NJ-CT	18	10-24	0.0	76,873	23,697
20197	Meadowlands Transportation Brokerage Corporation, dba Meadowlink	NJ	Monessen-California, PA	18	10-24	1,255.9	223,743	12,248
30103	Martz Group, National Coach Works of Virginia	VA	Washington, DC-VA-MD	18	10-24	0.0	21,167	12,512
40009	Fayetteville Area System of Transit	NC	Fayetteville, NC	18	10-24	1,914.2	22,820	77,635
40074	Pasco County Public Transportation	FL	Tampa-St. Petersburg, FL	18	10-24	2,753.5	63,242	47,033
50088	Shoreline Metro	WI	Sheboygan, WI	18	10-24	65.3	6,425	26,401
50091	Wausau Area Transit System	WI	Wausau, WI	18	10-24	0.0	6,550	32,050
60062	University of Arkansas, Fayetteville	AR	Fayetteville-Springdale-Rogers, AR-MO	18	10-24	0.0	6,609	96,497
70009	Davenport Public Transit	IA	Davenport, IA-IL	18	10-24	0.0	10,965	75,087
80009	Missoula Urban Transportation District	MT	Missoula, MT	18	10-24	128.9	8,980	44,157
90168	Roseville Transit	CA	Sacramento, CA	18	10-24	1,026.3	16,250	18,314
90226	Imperial County Transportation Commission	CA	El Centro-Calexico, CA	18	10-24	0.0	23,216	42,083
90236	Stanislaus County Public Works - Transit	CA	Modesto, CA	18	10-24	0.0	71,542	17,049
60015	Island Transit	TX	New York-Newark, NY-NJ-CT	17	10-24	0.0	6,111	40,767
20165	Olympia Trails Bus Company, Inc.	NJ	Poughkeepsie-Newburgh, NY-NJ	17	10-24	333.8	549,743	29,880
20178	Ulster County Area Transit	NY	Baltimore, MD	17	10-24	5.2	21,800	20,651
30040	Annapolis Department of Transportation	MD	Baltimore, MD	17	10-24	0.0	14,888	36,662
30048	Howard Transit	MD	Gulfport, MS	17	10-24	1,776.9	32,485	52,076

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40014	Ms Coast Transportation Authority	MS	Texas Non-UZA	17	10-24	573.2	17,323	40,167
60038	Lafayette Transit System	LA	Lafayette, LA	17	10-24	563.7	17,712	65,760
60102	Concho Valley Transit District	TX	San Angelo, TX	17	10-24	798.2	14,541	10,910
80028	Cache Valley Transit District	UT	Logan, UT	17	10-24	520.5	7,354	95,202
90131	City of Scottsdale - Scottsdale Trolley	AZ	Phoenix-Mesa, AZ	17	10-24	1,981.5	8,880	43,630
30072	Transit Services of Frederick County	MD	Frederick, MD	16	10-24	0.0	7,620	37,731
40005	ART (Asheville Redefines Transit)	NC	Asheville, NC	16	10-24	1,309.5	11,842	70,117
40024	Metra Transit System (Columbus, GA)	GA	Columbus, GA-AL	16	10-24	919.1	35,682	53,889
40053	Greenville Transit Authority	SC	Greenville, SC	16	10-24	1,039.1	33,503	48,807
40054	Johnson City Transit System	TN	Johnson City, TN	16	10-24	208.5	12,942	33,184
40092	Clarksville Transit System	TN	Clarksville, TN-KY	16	10-24	288.4	16,527	34,478
40140	Collier Area Transit	FL	Bonita Springs, FL	16	10-24	816.1	37,235	57,895
40159	Regional Transportation Authority	TN	Nashville-Davidson, TN	16	10-24	992.4	177,309	9,700
50045	Gary Public Transportation Corporation	IN	Chicago, IL-IN	16	10-24	1,345.2	10,172	36,519
50099	Eau Claire Transit	WI	Eau Claire, WI	16	10-24	0.0	8,760	47,644
50157	Butler County Regional Transit Authority	OH	Cincinnati, OH-KY-IN	16	10-24	414.1	40,602	24,718
60097	Midland-Odessa Urban Transit District	TX	Odessa, TX	16	10-24	1,741.6	13,492	18,921
70032	St. Joseph Transit	MO	St. Joseph, MO-KS	16	10-24	15.4	11,623	20,759
90229	El Dorado County Transit Authority	CA	Sacramento, CA	16	10-24	0.0	5,390	16,708
10007	Berkshire Regional Transit Authority	MA	Pittsfield, MA	15	10-24	2,330.1	20,273	28,079
10102	Connecticut Department of Transportation	CT	Hartford, CT	15	10-24	0.0	45,750	11,212
20005	C-TRAN	NY	Elmira, NY	15	10-24	2,333.3	16,183	31,464
20208	County of Burlington	NJ	Philadelphia, PA-NJ-DE-MD	15	10-24	0.0	55,350	6,084
30074	Harford Transit	MD	Aberdeen-Bel Air South-Bel Air North, MD	15	10-24	22.4	23,608	15,370
30088	County Commissioners of Charles County, MD	MD	Waldorf, MD	15	10-24	521.8	14,069	36,085
30096	The Tri-County Council for the Lower Eastern Shore of Maryland	MD	Salisbury, MD-DE	15	10-24	174.3	17,671	15,505

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40056	Pee Dee Regional Transportation Authority	SC	Florence, SC	15	10-24	262.9	52,646	11,218
50108	Janesville Transit System	WI	Janesville, WI	15	10-24	6,488.9	9,286	21,718
50159	River Valley Metro Mass Transit District	IL	Kankakee, IL	15	10-24	199.9	8,630	46,426
60026	City of Monroe Transit System	LA	Monroe, LA	15	10-24	971.6	5,900	58,408
60094	The Lawton Area Transit System	OK	Lawton, OK	15	10-24	0.0	15,158	21,558
60096	Cleveland Area Rapid Transit	OK	Norman, OK	15	10-24	101.3	11,130	49,061
90219	Northern Arizona Intergovernmental Public Transportation Authority	AZ	Flagstaff, AZ	15	10-24	3,558.7	6,620	90,020
10096	City of Bangor - BAT Community Connector	ME	Manchester, NH	14	10-24	20.0	8,381	46,747
40188	Virgin Islands Department of Public Works	VI	Dover-Rochester, NH-ME	14	10-24	0.0	13,407	7,462
10002	Manchester Transit Authority	NH	Bangor, ME	14	10-24	0.0	18,545	23,769
10086	Cooperative Alliance for Seacoast Transportation	NH	New York-Newark, NY-NJ-CT	14	10-24	0.0	18,656	22,981
20196	Middlesex County Area Transit	NJ	Wheeling, WV-OH	14	10-24	0.0	81,305	17,207
30035	Ohio Valley Regional Transportation Authority	WV	Hagerstown, MD-WV-PA	14	10-24	36.3	9,876	21,547
30090	Eastern Panhandle Transit Authority	WV	Sebastian-Vero Beach South-Florida Ridge, FL	14	10-24	247.4	25,057	7,382
40104	Indian River County	FL	Virgin Islands, VI	14	10-24	5,755.0	25,003	52,912
50004	LaCrosse Municipal Transit Utility	WI	La Crosse, WI-MN	14	10-24	0.0	7,476	58,445
50030	Battle Creek Transit	MI	Battle Creek, MI	14	10-24	14.5	13,082	26,582
60012	Waco Transit System, Inc.	TX	Waco, TX	14	10-24	9.4	13,365	51,899
60072	Ozark Regional Transit	AR	Fayetteville-Springdale-Rogers, AR-MO	14	10-24	210.4	41,146	13,448
60082	The Gulf Coast Center	TX	Texas City, TX	14	10-24	542.0	67,322	13,705
60091	Hill Country Transit District	TX	Killeen, TX	14	10-24	274.6	54,947	32,046
90200	Kings County Area Public Transit Agency	CA	Hanford, CA	14	10-24	2.1	11,032	37,494
90231	City of Irvine	CA	Los Angeles-Long Beach-Anaheim, CA	14	10-24	0.0	23,294	12,797
50205	Greater Mankato Transit System	MN	Portland, OR-WA	13	10-24	299.7	4,532	36,007

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70050	Southeast Missouri State University	MO	Atlantic City, NJ	13	10-24	0.0	1,508	16,293
00046	South Metro Area Regional Transit	OR	Augusta-Richmond County, GA-SC	13	10-24	65.6	2,544	17,478
20200	South Jersey Transportation Authority	NJ	Huntsville, AL	13	10-24	900.9	201,330	5,556
40023	Augusta Richmond County Transit Department	GA	Mankato, MN	13	10-24	0.0	27,876	38,547
40071	City of Huntsville, Alabama - Public Transportation Division	AL	Dubuque, IA-IL	13	10-24	65.8	16,002	27,314
70011	City of Dubuque	IA	Waterloo, IA	13	10-24	692.5	6,960	20,048
70013	Metropolitan Transit Authority of Black Hawk County	IA	Cape Girardeau, MO-IL	13	10-24	233.3	12,476	20,887
80007	Pueblo Transit System	CO	Pueblo, CO	13	10-24	0.0	19,268	49,483
80012	Great Falls Transit District	MT	Great Falls, MT	13	10-24	0.0	11,403	21,366
90093	Redding Area Bus Authority	CA	Redding, CA	13	10-24	1,024.0	22,130	40,568
90161	City of Union City Transit Division	CA	San Francisco-Oakland, CA	13	10-24	0.0	7,062	19,712
00059	Josephine County	OR	Grants Pass, OR	12	10-24	0.0	13,000	9,028
10053	Cape Ann Transportation Authority	MA	Boston, MA-NH-RI	12	10-24	137.5	4,922	9,467
20137	Monroe Bus Corporation	NY	Poughkeepsie-Newburgh, NY-NJ	12	10-24	0.0	42,238	15,748
20158	Tioga County	NY	Binghamton, NY-PA	12	10-24	0.0	8,008	2,670
30003	Mid-Ohio Valley Transit Authority	WV	Parkersburg, WV-OH	12	10-24	927.9	7,046	25,057
30009	Petersburg Area Transit	VA	Richmond, VA	12	10-24	1,788.2	3,855	20,397
30095	County of Lebanon Transit Authority	PA	Lebanon, PA	12	10-24	0.0	18,833	15,129
30108	Cecil County Government - SSCT	MD	Philadelphia, PA-NJ-DE-MD	12	10-24	248.8	12,509	2,175
40011	High Point Transit	NC	High Point, NC	12	10-24	202.4	14,716	42,733
40128	Okaloosa County Board of County Commissioners	FL	Fort Walton Beach-Navarre-Wright, FL	12	10-24	1,320.0	26,868	7,953
50020	Springfield City Area Transit	OH	Springfield, OH	12	10-24	111.0	11,543	12,843
50148	Blue Water Area Transportation Commission	MI	Port Huron, MI	12	10-24	1,723.7	30,488	48,446
50199	Delaware County Transit Board	OH	Columbus, OH	12	10-24	68.9	18,292	2,769
60001	Amarillo City Transit	TX	Amarillo, TX	12	10-24	0.0	21,167	17,922
60016	Beaumont Municipal Transit System	TX	Beaumont, TX	12	10-24	0.0	11,417	26,228

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60040	CityLink Transit	TX	Abilene, TX	12	10-24	94.0	17,447	24,711
60049	Las Cruces Area Transit	NM	Las Cruces, NM	12	10-24	1,011.7	11,816	36,027
70047	Unified Government Transit Department	KS	Kansas City, MO-KS	12	10-24	427.8	19,541	7,572
80010	City of Greeley - Transit Services	CO	Greeley, CO	12	10-24	565.2	11,102	26,073
80016	Mesa County	CO	Grand Junction, CO	12	10-24	1,026.4	19,560	44,192
90155	City of Vacaville	CA	Vacaville, CA	12	10-24	1,320.4	10,525	25,049
00047	City of Corvallis	OR	Pocatello, ID	11	10-24	3,318.9	5,751	55,302
00064	Valley Transit	WA	Fairbanks, AK	11	10-24	1,346.8	5,981	38,227
30137	Monroe County Transportation Authority	PA	Corvallis, OR	11	10-24	1,035.9	26,777	11,969
50174	City of Danville/Danville Mass Transit	IL	Walla Walla, WA-OR	11	10-24	0.0	8,159	30,357
00022	City of Pocatello - Pocatello Regional Transit	ID	Hartford, CT	11	10-24	0.0	11,769	14,548
00045	Fairbanks North Star Borough Transit	AK	New York-Newark, NY-NJ-CT	11	10-24	0.0	11,319	25,691
10130	Connecticut Department of Transportation - CTTRANSIT New Britain	CT	Syracuse, NY	11	10-24	5.8	24,835	41,710
20085	Clarkstown Mini-Trans	NY	Syracuse, NY	11	10-24	13.6	30,317	6,110
20116	Centro of Cayuga, Inc.	NY	East Stroudsburg, PA-NJ	11	10-24	2,962.6	8,008	20,194
20172	Centro of Oswego, Inc.	NY	Panama City, FL	11	10-24	1,988.3	12,453	26,817
40185	Bay County Transportation Planning Organization	FL	Aguadilla-Isabela-San Sebastian, PR	11	10-24	253.0	19,040	33,351
40197	Municipality of Lares	PR	San Juan, PR	11	10-24	0.0	7,350	2,240
40201	Municipality of Guaynabo	PR	Jackson, MI	11	10-24	47.6	21,157	27,613
50034	City of Jackson Transportation Authority	MI	Muskegon, MI	11	10-24	1,672.2	25,800	26,910
50037	Muskegon Area Transit System	MI	Danville, IL-IN	11	10-24	396.9	27,206	33,280
60108	Harris County Community Services Department, Office of Transit Services	TX	Houston, TX	11	10-24	53.6	454,879	4,952
30087	Fayette Area Coordinated Transportation	PA	New York-Newark, NY-NJ-CT	10	10-24	80.2	26,775	9,850
90156	City of San Luis Obispo	CA	Philadelphia, PA-NJ-DE-MD	10	10-24	115.5	4,416	55,995

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20071	Huntington Area Rapid Transit	NY	Uniontown-Connellsville, PA	10	10-24	390.9	20,548	7,344
20201	County of Cumberland	NJ	Hickory, NC	10	10-24	284.7	19,298	3,327
40172	Western Piedmont Regional Transit Authority	NC	Oshkosh, WI	10	10-24	0.0	58,506	5,597
50009	GO Transit	WI	Houma, LA	10	10-24	708.6	8,789	44,457
60080	Terrebonne Parish Consolidated Government	LA	Victoria, TX	10	10-24	652.2	13,331	8,051
60095	Golden Crescent Regional Planning Commission	TX	San Luis Obispo, CA	10	10-24	0.0	9,333	11,171
90214	City of Redondo Beach - Beach Cities Transit	CA	Los Angeles-Long Beach-Anaheim, CA	10	10-24	0.0	6,454	19,323
30109	St. Mary's Transit System -Dept. of Public Works and Transit	MD	Longview, WA-OR	9	under 10	553.0	5,456	17,367
40049	Gadsden Transportation Services - City of Gadsden	AL	Portland, ME	9	under 10	29.8	10,019	4,178
60131	San Marcos Urban Transit District	TX	New York-Newark, NY-NJ-CT	9	under 10	90,896.4	5,917	6,316
70043	City of Jefferson	MO	Lexington Park-California-Chesapeake Ranch Estates, MD	9	under 10	0.0	5,980	13,268
00016	RiverCities Transit	WA	Owensboro, KY	9	under 10	316.3	11,560	19,244
10114	Biddeford-Saco-Old Orchard Beach Transit Committee Shuttle Bus	ME	Gadsden, AL	9	under 10	480.9	8,211	7,884
20078	Metro-North Commuter Railroad Company, dba: MTA Metro-North Railroad	NY	Jackson, TN	9	under 10	188.1	656,893	17,786
40020	Owensboro Transit System	KY	Raleigh, NC	9	under 10	0.0	8,910	21,886
40057	Jackson Transit Authority	TN	Jacksonville, NC	9	under 10	0.0	10,493	27,907
40143	Town of Cary	NC	Mansfield, OH	9	under 10	0.0	12,765	14,791
40166	City of Jacksonville	NC	Beloit, WI-IL	9	under 10	660.0	11,153	5,547
50090	Richland County Transit	OH	Cincinnati, OH-KY-IN	9	under 10	244.4	10,686	12,832
50109	City of Beloit Transit System	WI	Wichita Falls, TX	9	under 10	837.3	5,345	11,772
50166	Clermont Transportation Connection	OH	San Marcos, TX	9	under 10	0.0	21,716	3,499
60035	Wichita Falls Transit System	TX	Davenport, IA-IL	9	under 10	0.0	15,512	22,207
70007	Bettendorf Transit System	IA	Jefferson City, MO	9	under 10	0.0	3,929	10,655

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80014	Rapid Transit System	SD	Rapid City, SD	9	under 10	275.9	8,359	14,094
90175	City of Lodi - Transit Division	CA	Lodi, CA	9	under 10	209.4	7,680	10,413
90198	City of Porterville	CA	Porterville, CA	9	under 10	860.3	7,140	30,656
10098	Western Maine Transportation Services, Inc.	ME	Nashua, NH-MA	8	under 10	11.3	36,099	7,438
30093	City of Hazleton -- Hazleton Public Transit	PA	Lewiston, ME	8	under 10	113.9	8,532	10,658
50171	Fond du Lac Area Transit	WI	Hagerstown, MD-WV-PA	8	under 10	47.8	5,703	7,555
60100	City of Farmington dba: Red Apple Transit	NM	Washington, DC-VA-MD	8	under 10	0.0	4,732	6,614
70053	Flint Hills Area Transportation	KS	Hazleton, PA	8	under 10	0.0	13,135	12,195
10087	Nashua Transit System	NH	Albany, GA	8	under 10	1,038.6	9,389	24,277
30042	Washington County Transit	MD	Port St. Lucie, FL	8	under 10	2,813.9	7,715	21,434
30058	City of Fairfax CUE Bus	VA	Spartanburg, SC	8	under 10	289.1	1,805	40,511
40021	Albany Transit System	GA	Winter Haven, FL	8	under 10	1,751.4	9,754	50,801
40097	Council on Aging of St. Lucie, Inc.	FL	Gainesville, GA	8	under 10	939.0	47,973	9,119
40101	Spartanburg Transit System	SC	Mayaguez, PR	8	under 10	0.0	5,922	23,891
40127	Polk County Transit Services Division - Polk County Board of County Commissioners	FL	Fargo, ND-MN	8	under 10	75.7	29,187	11,276
40144	Hall Area Transit	GA	Terre Haute, IN	8	under 10	165.4	3,655	7,193
40194	Municipality of Mayaguez	PR	Elkhart, IN-MI	8	under 10	117.5	11,359	16,441
50026	City of Moorhead, DBA: Metropolitan Area Transit	MN	Milwaukee, WI	8	under 10	120.1	4,295	23,627
50053	Terre Haute Transit Utility	IN	Fond du Lac, WI	8	under 10	24.0	11,029	20,092
50149	Michiana Area Council of Governments	IN	Chicago, IL-IN	8	under 10	0.0	19,691	23,049
50160	Washington County Transit	WI	Holland, MI	8	under 10	413.2	16,179	5,407
50183	City of Valparaiso	IN	Alexandria, LA	8	under 10	8.7	3,141	9,490
50184	Macatawa Area Express Transportation Authority	MI	McAllen, TX	8	under 10	1,570.3	7,730	19,028
60025	City of Alexandria	LA	Farmington, NM	8	under 10	126.2	10,445	34,715
60099	City of McAllen - McAllen Express Transit	TX	Albuquerque, NM	8	under 10	1,996.3	16,105	36,435
60111	Rio Metro Regional Transit District	NM	Manhattan, KS	8	under 10	252.4	123,629	3,954
80008	Cities Area Transit	ND	Grand Forks, ND-MN	8	under 10	230.2	7,180	16,987

NTD ID	Reporting Transit Agency	State	Primary UZA	Bus VOMS	Bus VOMS Category (by NTD Group)	Total Federal Capital Funds ($1000s)	Service Area Population - PWD (Estimated)*	Unlinked Passenger Trips - PWD (Estimated)*
80020	The City of Cheyenne Transit Program	WY	Cheyenne, WY	8	under 10	195.6	7,493	13,319
90043	City of Commerce Municipal Buslines	CA	Los Angeles-Long Beach-Anaheim, CA	8	under 10	231.5	1,239	31,353
90165	Thousand Oaks Transit	CA	Thousand Oaks, CA	8	under 10	186.3	18,841	11,489
90197	City of Tracy	CA	Tracy, CA	8	under 10	0.0	7,055	6,084
90213	City of Petaluma	CA	Petaluma, CA	8	under 10	1,240.9	6,479	17,616
10015	Lewiston-Auburn Transit Committee	ME	Lewiston, ME	7	under 10	18.0	8,842	18,270
30041	Allegany County Transit	MD	Hartford, CT	7	under 10	7,194.2	12,243	8,749
30989	Central Shenandoah Planning District Commission	VA	Portland, ME	7	under 10	861.1	7,190	3,456
10063	Middletown Transit District	CT	Poughkeepsie-Newburgh, NY-NJ	7	under 10	0.0	11,019	18,727
10112	South Portland Bus Service	ME	Cumberland, MD-WV-PA	7	under 10	0.0	3,074	12,672
20148	Newburgh Beacon Bus Corporation	NY	Staunton-Waynesboro, VA	7	under 10	0.0	27,000	6,192
40045	Tuscaloosa County Parking and Transit Authority	AL	Tuscaloosa, AL	7	under 10	258.0	14,331	14,904
40096	Tar River Transit	NC	Rocky Mount, NC	7	under 10	856.2	9,637	15,384
40155	St Johns County, Florida, Board of County Commissioners	FL	St. Augustine, FL	7	under 10	443.2	27,807	12,711
40158	Lake County Board of County Commissioners	FL	Leesburg-Eustis-Tavares, FL	7	under 10	431.8	17,744	15,600
40167	Concord Kannapolis Area Transit	NC	Concord, NC	7	under 10	4,595.2	11,025	23,031
40177	Buckhead Community Improvement District	GA	Atlanta, GA	7	under 10	0.0	16,416	5,658
40191	Transit Authority of Central Kentucky	KY	Elizabethtown-Radcliff, KY	7	under 10	195.8	28,707	1,701
40234	Autonomous Municipality of Ponce	PR	Ponce, PR	7	under 10	0.0	11,470	50,278
50041	City of Anderson Transportation System	IN	Anderson, IN	7	under 10	776.6	9,848	10,663
50093	Lima Allen County Regional Transit Authority	OH	Lima, OH	7	under 10	1,029.0	16,232	14,318
70030	Coralville Transit System	IA	Iowa City, IA	7	under 10	470.4	1,288	28,886
80013	City of Casper	WY	Casper, WY	7	under 10	55.7	7,656	8,121
80019	Bis-Man Transit Board	ND	Bismarck, ND	7	under 10	798.0	10,609	6,792
90244	City of Tulare	CA	Visalia, CA	7	10-24	0.0	7,617	21,582
10107	Milford Transit District	CT	Bridgeport-Stamford, CT-NY	6	under 10	195.8	4,641	20,055
20009	City of Poughkeepsie	NY	Poughkeepsie-Newburgh, NY-NJ	6	under 10	151.8	3,461	17,861

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20096	Putnam County Transit	NY	New York-Newark, NY-NJ-CT	6	under 10	0.0	7,099	6,126
20175	Private Transportation Corporation	NY	New York-Newark, NY-NJ-CT	6	under 10	0.0	248,998	31,050
20179	Hendrick Hudson Bus Lines, Inc.	NY	Poughkeepsie-Newburgh, NY-NJ	6	under 10	0.0	29,901	2,172
30101	City of Washington	PA	Pittsburgh, PA	6	under 10	1,547.7	8,259	2,985
40010	City of Gastonia	NC	Gastonia, NC-SC	6	under 10	0.0	13,690	13,873
40016	Ashland Bus System	KY	Huntington, WV-KY-OH	6	under 10	0.0	4,802	6,260
40080	Kingsport Area Transit System	TN	Kingsport, TN-VA	6	under 10	6.4	8,966	8,318
40095	Greenville Area Transit	NC	Greenville, NC	6	under 10	112.4	9,132	26,704
40120	City of Ocala, Florida	FL	Ocala, FL	6	under 10	95.9	11,444	21,367
40137	Municipality of Bayamon	PR	San Juan, PR	6	under 10	842.3	14,192	9,071
40150	Municipality of Barceloneta	PR	Florida-Imbary-Barceloneta, PR	6	under 10	484.4	5,881	5,471
40184	The City of Bowling Green/Community Action of Southern Kentucky	KY	Bowling Green, KY	6	under 10	22.2	6,750	5,195
40186	City of Murfreesboro	TN	Murfreesboro, TN	6	under 10	460.5	11,724	13,002
40195	Municipality of San Lorenzo	PR	San Juan, PR	6	under 10	48.6	7,020	4,145
50142	Steel Valley Regional Transit Authority	OH	Weirton-Steubenville, WV-OH-PA	6	under 10	12.7	3,848	7,406
60086	Fort Smith Transit	AR	Fort Smith, AR-OK	6	under 10	57.2	14,311	11,845
60093	Texarkana Urban Transit District	TX	Texarkana-Texarkana, TX-AR	6	under 10	0.0	12,544	15,432
60104	Jonesboro Economical Transportation System	AR	Jonesboro, AR	6	under 10	56.3	8,030	4,238
60118	City of Edmond	OK	Oklahoma City, OK	6	under 10	0.0	11,560	13,162
80107	The University of Montana - ASUM Transportation	MT	Missoula, MT	6	under 10	0.0	10,240	19,388
90050	Simi Valley Transit	CA	Simi Valley, CA	6	under 10	910.8	13,147	18,754
90199	City of Madera	CA	Madera, CA	6	under 10	592.6	7,502	7,042
40132	Goldsboro-Wayne Transportation Authority	NC	New York-Newark, NY-NJ-CT	5	under 10	2,380.0	5,917	10,882
90239	City of Sierra Vista	AZ	Glens Falls, NY	5	under 10	230.2	7,452	7,916
20006	City of Long Beach	NY	New York-Newark, NY-NJ-CT	5	under 10	0.0	3,535	19,209
20120	Greater Glens Falls Transit System	NY	Youngstown, OH-PA	5	under 10	130.2	10,507	16,616
20202	Essex County Division of Training and Employment	NJ	Pottstown, PA	5	under 10	0.0	79,181	5,431

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30055	Shenango Valley Shuttle Service	PA	Parkersburg, WV-OH	5	under 10	0.0	18,545	5,385
30077	Borough of Pottstown - Pottstown Area Rapid Transit	PA	High Point, NC	5	under 10	0.0	6,732	12,452
30098	Washington County Commissioners	OH	Goldsboro, NC	5	under 10	0.0	3,728	839
40131	Davidson County Transportation	NC	San Juan, PR	5	under 10	188.9	23,092	6,684
40165	Municipality of Juncos	PR	Cleveland, TN	5	under 10	238.2	7,992	3,220
40170	Southeast Tennessee Human Resource Agency -Cleveland Urban Area Transit System Division	TN	Port St. Lucie, FL	5	under 10	182.4	13,200	4,822
40192	Martin County	FL	San Juan, PR	5	under 10	1.9	24,674	1,771
40199	Autonomous Municipality of Vega Alta	PR	Asheville, NC	5	under 10	361.0	8,629	1,624
40224	Buncombe County	NC	Augusta-Richmond County, GA-SC	5	under 10	0.0	33,841	1,404
40235	Aiken Area Council on Aging, Inc.	SC	Milwaukee, WI	5	under 10	107.6	22,935	1,788
50161	Ozaukee County Transit Services	WI	Huntington, WV-KY-OH	5	under 10	0.0	10,539	5,577
50186	Lawrence County Port Authority	OH	Cleveland, OH	5	under 10	59.5	23,161	1,060
50198	Medina County Public Transit	OH	Port Arthur, TX	5	under 10	356.8	24,300	929
60013	Port Arthur Transit	TX	Lake Charles, LA	5	under 10	54.8	9,356	6,073
60023	Lake Charles Transit System	LA	Longview, TX	5	under 10	452.8	13,152	13,089
60081	Longview Transit	TX	Tyler, TX	5	under 10	391.0	11,262	12,197
60089	City of Tyler	TX	Kansas City, MO-KS	5	under 10	0.0	13,811	7,945
70046	City of Independence	MO	St. George, UT	5	under 10	393.1	14,721	13,906
80026	City of St. George	UT	Riverside-San Bernardino, CA	5	under 10	0.0	10,050	22,268
90052	City of Corona	CA	Sierra Vista, AZ	5	under 10	45.8	15,840	8,318
00061	City of Albany	OR	Idaho Falls, ID	4	under 10	55.7	8,572	10,458
00065	Benton County	OR	Albany, OR	4	under 10	64.1	9,005	463
50132	Twin Cities Area Transportation Authority	MI	Corvallis, OR	4	under 10	73.4	3,942	3,433
50145	City of Kokomo	IN	Hartford, CT	4	under 10	0.0	9,514	19,734
50177	ColumBUS Transit	IN	Manchester, NH	4	under 10	0.0	6,130	10,007
60034	Pine Bluff Transit	AR	Poughkeepsie-Newburgh, NY-NJ	4	under 10	0.0	8,491	3,952
90215	Carson Area Metropolitan Planning Organization	NV	New York-Newark, NY-NJ-CT	4	under 10	119.2	7,056	8,964

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90238	City of Delano	CA	Weirton-Steubenville, WV-OH-PA	4	under 10	124.1	5,824	8,441
90240	City of Lake Havasu	AZ	Westminster-Eldersburg, MD	4	under 10	114.4	12,586	3,537
00042	Targhee Regional Public Transit Authority	ID	Winchester, VA	4	under 10	127.5	11,432	899
10132	State of Connecticut - CTTransit - Nason - Torrington-Winsted	CT	Hattiesburg, MS	4	under 10	172.5	5,818	971
11154	Flight Line, Inc.	NH	Anniston-Oxford, AL	4	under 10	163.7	39,747	316
20187	Village of Kiryas Joel	NY	Anderson, SC	4	under 10	149.5	2,520	5,525
20192	Bergen County Community Transportation	NJ	Spring Hill, FL	4	under 10	213.6	91,417	1,401
30066	Weirton Transit Corporation	WV	Arecibo, PR	4	under 10	0.0	3,828	2,838
30092	Carroll County Department of Public Works	MD	Charlotte, NC-SC	4	under 10	402.3	16,254	814
30099	City of Winchester	VA	Middletown, OH	4	under 10	0.0	3,016	5,231
40060	Hub City Transit	MS	Michigan City-La Porte, IN-MI	4	under 10	105.8	9,706	4,447
40064	East Alabama Regional Planning and Development Commission	AL	Benton Harbor-St. Joseph-Fair Plain, MI	4	under 10	230.5	57,423	8,735
40081	Anderson Transit Authority	SC	Kokomo, IN	4	under 10	84.6	3,904	16,559
40146	Hernando County Board of County Commissioners	FL	Columbus, IN	4	under 10	94.0	16,207	4,392
40160	Municipality of Camuy	PR	DeKalb, IL	4	under 10	0.0	6,510	1,266
40205	Iredell County Area Transportation Services	NC	Pine Bluff, AR	4	under 10	209.3	15,314	288
50019	City of Middletown - Middletown Transit System	OH	New Orleans, LA	4	under 10	8.9	8,859	8,053
50098	Michigan City Transit	IN	Turlock, CA	4	under 10	0.0	4,407	7,660
50215	Voluntary Action Center	IL	Carson City, NV	4	under 10	461.4	5,515	7,053
60058	St. Bernard Urban Rapid Transit	LA	Manteca, CA	4	under 10	465.0	5,207	4,257
90201	City of Turlock	CA	Sacramento, CA	4	under 10	0.0	11,686	5,207
90217	City of Manteca	CA	Delano, CA	4	under 10	0.0	6,969	2,913
90235	City of Lincoln	CA	Lake Havasu City, AZ	4	under 10	91.0	5,682	2,128
00051	Asotin County PTBA	WA	Lewiston, ID-WA	3	under 10	0.0	3,984	2,857
20191	City of Kingston Citibus	NY	Kingston, NY	3	under 10	0.0	3,475	3,812
20215	Watertown CitiBus	NY	Watertown, NY	3	under 10	6.6	3,929	7,077

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40193	Liberty Transit	GA	Bristol-Bristol, TN-VA	3	under 10	0.0	3,210	796
60105	Intracity Transit	AR	Bristol-Bristol, TN-VA	3	under 10	0.0	6,722	8,053
70051	Cape Girardeau County Transit Authority	MO	San Juan, PR	3	under 10	49.8	9,762	1,263
30053	Bristol Virginia Transit	VA	San Juan, PR	3	under 10	0.0	3,852	4,059
40055	Bristol Tennessee Transit System	TN	Arecibo, PR	3	under 10	114.7	5,768	2,942
40122	Municipality of Cayey	PR	Nashville-Davidson, TN	3	under 10	655.4	10,232	1,463
40126	Municipality of Humacao	PR	Fajardo, PR	3	under 10	0.0	5,400	5,795
40151	Municipality of Hatillo	PR	San Juan, PR	3	under 10	180.0	7,254	929
40162	Franklin Transit Authority	TN	Hinesville, GA	3	under 10	0.0	7,012	2,445
40164	Municipality of Fajardo	PR	San Juan, PR	3	under 10	0.0	56	2,305
40182	Municipality of Toa Baja	PR	Asheville, NC	3	under 10	0.0	16,200	9,346
40198	Municipality of Dorado	PR	Concord, NC	3	under 10	0.0	8,244	1,775
40229	Henderson County/ Apple Country Public Transit	NC	Miami, FL	3	under 10	0.0	10,114	5,068
40233	City of Salisbury - Salisbury	NC	Chicago, IL-IN	3	under 10	0.0	4,108	8,132
44929	City of Fort Lauderdale	FL	Evansville, IN-KY	3	under 10	73.8	19,712	723
50042	East Chicago Transit	IN	Indianapolis, IN	3	under 10	0.0	2,940	9,001
50107	Henderson Area Rapid Transit	KY	Hot Springs, AR	3	under 10	63.5	4,239	6,613
50209	Central Indiana Regional Transportation Authority	IN	Dallas-Fort Worth-Arlington, TX	3	under 10	0.0	249,189	1,291
60113	City of Cleburne	TX	Dallas-Fort Worth-Arlington, TX	3	under 10	4.5	14,388	274
60115	Public Transit Services	TX	Joplin, MO	3	under 10	356.5	13,886	427
70040	City of Joplin Metro Area Public	MO	Cape Girardeau, MO-IL	3	under 10	97.0	13,500	4,829
80025	City of Loveland Transit	CO	Fort Collins, CO	3	under 10	0.0	5,640	6,371
90034	City of Glendale Transit	AZ	Phoenix-Mesa, AZ	3	under 10	869.3	25,166	5,682
90195	Paso Robles Transit Services	CA	El Paso de Robles (Paso Robles)-Atascadero, CA	3	under 10	70.0	3,477	6,977
00048	Lewiston Transit System	ID	Lewiston, ID-WA	2	under 10	203.7	5,642	1,826
00063	City of Milton-Freewater	OR	Coeur d'Alene, ID	2	under 10	231.8	1,500	353
00053	Coeur d'Alene Tribe dba Citylink Transit	ID	Coeur d'Alene, ID	2	under 10	574.6	3,030	10,003
00055	Kootenai County	ID	Marysville, WA	2	under 10	0.0	11,254	9,395
00060	The Tulalip Tribes of Washington	WA	Walla Walla, WA-OR	2	under 10	0.0	647	442

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10049	The Greater New Haven Transit District	CT	New Haven, CT	2	under 10	1,516.3	49,212	228
20176	Kaser Bus Service	NY	New York-Newark, NY-NJ-CT	2	under 10	0.0	477	1,809
20212	County of Hunterdon	NJ	New York-Newark, NY-NJ-CT	2	under 10	0.0	30,199	758
20213	City of Mechanicville	NY	Albany-Schenectady, NY	2	under 10	0.0	608	396
30111	Washington Rides	PA	Pittsburgh, PA	2	under 10	90.1	27,848	1,042
40073	Lee-Russell Council of Governments	AL	Auburn, AL	2	under 10	0.0	20,285	1,011
40121	Municipality of Hormigueros	PR	Mayaguez, PR	2	under 10	4.0	4,813	2,770
40124	Municipality of Cidra	PR	San Juan, PR	2	under 10	0.0	515	491
40145	Municipality of Manati	PR	San Juan, PR	2	under 10	0.0	3,852	2,578
40161	Cherokee County Board of Commissioners	GA	Atlanta, GA	2	under 10	0.0	1,839	1,532
40183	Municipality of San Sebastian	PR	Aguadilla-Isabela-San Sebastian, PR	2	under 10	0.0	10,025	298
40217	Iredell County Area Transportation Services	NC	Charlotte, NC-SC	2	under 10	230.7	15,314	1,327
40218	Oldham's Public Bus	KY	Louisville/Jefferson County, KY-IN	2	under 10	0.0	1,172	1,178
40231	Orange Public Transportation	NC	Durham, NC	2	under 10	0.0	13,555	818
50038	Niles Dial-A-Ride	MI	South Bend, IN-MI	2	under 10	71.3	33,786	720
50095	Lorain County Transit	OH	Lorain-Elyria, OH	2	under 10	235.7	24,897	2,422
50143	Brunswick Transit Alternative	OH	Cleveland, OH	2	under 10	0.0	6,296	1,600
90220	City of Folsom	CA	Sacramento, CA	2	under 10	0.0	9,090	4,055
20203	Cape May County Fare Free Transportation	NJ	Boston, MA-NH-RI	1	under 10	0.0	13,325	135
10123	Greater Derry Salem Cooperative Alliance for Regional Transportation	NH	Worcester, MA-CT	1	under 10	85.5	12,080	81
10126	Worcester Regional Transit Authority COA	MA	New York-Newark, NY-NJ-CT	1	under 10	0.0	21,036	9
20089	Village of Spring Valley Bus	NY	Twin Rivers-Hightstown, NJ	1	under 10	0.0	4,040	342
20194	East Windsor Township	NJ	Philadelphia, PA-NJ-DE-MD	1	under 10	208.5	2,366	403
20195	Gloucester County Division of Transportation Services	NJ	New York-Newark, NY-NJ-CT	1	under 10	0.0	35,703	100
20198	TransOptions, Inc.	NJ	Villas, NJ	1	under 10	0.0	5,448	49
20214	Town of Warwick Dial A Bus	NY	Poughkeepsie-Newburgh, NY-NJ	1	under 10	27.3	6,032	487
40114	Municipality of Aguada	PR	Aguadilla-Isabela-San Sebastian, PR	1	under 10	0.0	10,032	269
40117	Municipality of Vega Baja	PR	San Juan, PR	1	under 10	116.1	12,887	1,588

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40123	Federal Programs Municipality of Gurabo	PR	San Juan, PR	1	under 10	41.9	9,800	998
40221	Gaston County	NC	Gastonia, NC-SC	1	under 10	63.8	39,162	491
60114	STAR Transit	TX	Dallas-Fort Worth-Arlington, TX	1	under 10	328.6	18,025	279
70049	River Bend Transit	IA	Davenport, IA-IL	1	under 10	34.7	59,375	517
90163	Camarillo Area Transit	CA	Camarillo, CA	1	under 10	81.4	7,656	676
90194	City of Atascadero	CA	El Paso de Robles (Paso Robles)-Atascadero, CA	1	under 10	0.0	3,044	1,460
Totals =				**52,328**		**6,272,837.2**	**44,404,008**	**258,796,035**

Notes/Data Sources:

(a) **Primary Urbanized Area (UZA)** –Primary UZA of reporting transit agency as listed in 2014 NTD annual data; UZAs are based on Census 2010 UZA designations (which total 486 UZAs in the US and Puerto Rico).

(b) **Bus VOMS** - Calculated from 2014 NTD annual data by combining data for all fixed-route bus modes reported by each reporting transit agency (i.e., per 5-Digit NTD ID number). All 2014 NTD data is available on the NTD website (https://www.transit.dot.gov/ntd/ntd-data).

(c) **Bus VOMS Category (by NTD Group)** – Transit agencies assigned to one of seven Bus VOMS categories based on the Bus VOMS for each reporting transit agency. Bus VOMS categories mirror the seven VOMS-based size groupings used by FTA when reporting NTD annual summary data. *See, e.g.*, 2014 NTD Annual Summary – Tables 3 (Federal Government Sources for Transit Operating Funds Applied) & 7 (Transit Capital Funds Applied – Summary and Federal Sources).

(d) **Total Federal Capital Funds** - Calculated from 2014 NTD annual data based on all reported sources of federal "transit capital funds applied" for each reporting transit agency. *See* 2014 NTD Annual Data, 2014 Table 7: Transit Capital Funds Applied - Summary and Federal Sources.

(e) **Service Area Population - Persons with Disabilities (PWD)** - Estimated for each reporting transit agency as follows: (service area population per 2014 NTD annual data) x (applicable urbanized area (UZA) % of persons with disabilities (PWD)), with UZA PWD % based on US Census Bureau, Percent of People with a Disability - United States - Urbanized Areas and Puerto Rico (GCT1810) (2014 1-Yr Estimates, or, if unavailable, 2008-2010 ACS 3-Yr Estimates) (All Census data can be accessed through the Census Bureau's "American Fact Finder" data portal, available at: http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml).

(f) **Unlinked Passenger Trips (UPT) - Persons with Disabilities (PWD)** - Estimated for each reporting transit agency as follows: (total UPT for all bus modes per 2014 NTD annual data) x (.049), with .049 equal to the calculated average national fixed-route bus ridership by persons with disabilities from survey data in TCRP Report 163 (*see* discussion in FRIA, Section 6.1).