Estimating the Long-Term Impacts of MAP-21 on the Nation's Local Rural Transit Bus Infrastructure

DETAILS

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ESTIMATING THE LONG-TERM IMPACTS OF MAP-21 ON THE NATION'S LOCAL RURAL TRANSIT BUS INFRASTRUCTURE

This digest presents the results of an analysis of the long-term impacts of MAP-21 on the nation's rural transit infrastructure. This analysis includes a review of historical (since 2006) funding levels provided by federal, state, and local sources for rural transit, and a comparison of discretionary capital funding available under SAFETEA-LU with the new Section 5339 Bus and Bus Facilities formula program under MAP-21. The research was conducted by Sean Libberton, Crystal Cummings, Lisa Koch, Ihsaan Patel, and Amanda Wall Vandegrift of Parsons Brinckerhoff.

CONTENTS

SUMMARY

The Moving Ahead for Progress for the 21st Century Act (MAP-21) features many transformative elements: a new requirement for the development by transit operators of Public Transportation Agency Safety Plans and greater authority by the Federal Transit Administration (FTA) to promulgate and enforce safety mandates; an emphasis on ensuring a "state of good repair" (SGR) of transit capital assets, including the establishment of a new formula funding program specifically for recapitalization and preventive maintenance activities, as well as a requirement for transit agencies to implement transit asset management systems; and new programs for the recovery of transit after natural disasters and other emergencies, transit workforce development, and transit-oriented development.

MAP-21 further consolidates several long standing formula programs, establishes new formulas for the allocation of funds, and eliminates the discretionary Section 5309 Bus and Bus Facilities capital program. The result of these changes is an uncertainty about the overall impacts of MAP-21 on local public transportation agencies and the services they provide. With MAP-21 due to expire as early as September 30, 2014, there is a great need to understand the strengths, weaknesses, benefits, and detriments of the Act so as to inform subsequent federal surface transportation authorizing legislation.

This digest focuses on the impacts of MAP-21 on rural transit, and, even more specifically, on the impact of capital funding levels on the long-term reinvestment needs of the nation's rural transit infrastructure. The digest accomplishes four specific things. First, it summarizes the key changes of MAP-21 of particular interest to rural transit operators and state departments of transportation (DOTs) charged with administering federal rural transit programs. Second, it presents the results of an analysis of historical funding levels for rural public transportation, and how they compare with funding provided under MAP-21. This analysis shows the significant increase since 2007 in federal funding used to support rural public transportation, and the impact,

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in particular, of the American Recovery and Reinvestment Act of 2009 (ARRA) on its capital portfolio. The digest finds that the ARRA investment resulted in a significant improvement—as measured by annual asset age and estimated condition—in the nation's rural transit infrastructure, and allowed for greater use of the Section 5311 Rural Area Formula program for operating assistance. But because ARRA has expired, replacement and maintenance issues should be examined.

The future condition of the nation's rural transit infrastructure is the third concern of this digest. Utilizing National Transit Database (NTD) data and FTA's Transit Economic Requirements Model (TERM)-Lite simulation model, this digest finds that the replacement value of rural transit vehicles and facilities is nearly $3.6 billion, and that it would require a one-time investment of nearly $700 million to erase the deferred replacement deficit of those assets. Five funding scenarios are presented that demonstrate the impact of various annual funding levels on the state of repair of the nation's rural transit infrastructure through 2028. The digest finds that maintaining MAP-21 at historic funding levels results in a significant degradation of the condition of this infrastructure. However, the research also finds that, based on the NTD as analyzed by TERM-Lite, a sustained annual investment of approximately $285 million is sufficient to maintain the current state of repair of rural transit assets, while a $366 million annual investment would eliminate the investment backlog by 2028.

Finally, this digest summarizes the effectiveness of the research methodology and its potential applicability to broader capital investment analyses. The digest notes that the data and analytical tools employed in this research are readily available and relatively easy to use. However, it also acknowledges several limitations to the use of the NTD—particularly rural data related to both assets and revenue expenditures—which must be understood and noted in any future research based on this source.

CHAPTER 1 INTRODUCTION

This digest presents findings of the National Cooperative Highway Research Program's (NCHRP's) Project 20-65/Task 55: "Estimating the Long Term Impacts of MAP-21 on the Nation's Local Rural Transit Bus Infrastructure." The availability of capital acquisition resources, especially for bus replacement and fleet expansion, is an important element of effective and efficient rural transit services. Historically, timely access to FTA rural program resources has provided the bulk of the funding to help meet these capital needs. However, MAP-21 fundamentally changed how federal transit capital funding is distributed to and through state DOTs for rural public transportation systems. Most significantly, MAP-21 eliminated the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for User's (SAFETEA-LU's) Section 5309 Bus and Bus Facilities discretionary capital program and replaced it with a new—and smaller—Section 5339 Bus and Bus Facilities formula program. MAP-21 also made significant changes—including an increase of available funding—to the Section 5311 Formula Grants for Rural Areas program, as well changes to other programs of interest to rural transit, while also introducing several new federal requirements which must be met by recipients of FTA funding. It is the impact of these various changes on the nation's rural transit infrastructure that this research attempts to measure.

To that objective, Chapter 2 of this digest summarizes the six major changes to the rural transit program resulting from enactment of MAP-21:

1. Section 5311 Formula Grants for Rural Areas
2. Section 5311(c)(1) Public Transportation on Indian Reservations
3. Section 5310 Formula Grants for the Enhanced Mobility of Seniors and Individuals with Disabilities
4. Section 5339 Bus and Bus Facilities Program
5. Section 5326 Transit Asset Management
6. Section 5329 Safety

As detailed in Chapter 2, there remain many MAP-21 provisions that FTA has yet to implement. However, all significant statutory changes are identified and discussed, including program funding levels, allocation formulas, and requirements. Chapter 2 demonstrates a modest overall increase in formula funding for rural transit, but also a new set of capital asset management and safety requirements for which no specific funding is attached. MAP-21 provides state DOTs with both greater opportunities and flexibilities in the use of some formula funds (for example, the Section 5311 Rural Formula program), while limiting their discretion in the use of others (the Section 5310 Enhanced Mobility program). These distinctions are presented in Chapter 2.

Chapter 3 of the digest presents several historical trends in rural public transportation. Among other trends (ridership, levels of service, etc.), overall federal, state, and local investment in rural transit (both capital and operating) between 2006 (the first year SAFETEA-LU) and 2012 (the last year of available data) is provided. State-by-state expenditures in rural transit funded under the former discretionary Section 5309 Bus and Bus Facilities program—which was eliminated by MAP-21 and replaced by the formula Section 5339 program—are also presented. Chapter 3 shows the significant growth in rural transit since 2007, fueled largely by the one-time infusion of funding under ARRA. However, changes in program formulas and structures, including the consolidation of programs, limit other comparisons between SAFETEA-LU and MAP-21, and these constraints are acknowledged.

Chapter 4 of this digest presents an analysis of the capital investment needed to ensure the nation's rural transit infrastructure is in a state of good repair. After introducing the reader to FTA's Transit Economic Requirements Model (TERM)-Lite SGR simulation model, several long-term (15-year) investment scenarios are presented. The analyses show that maintaining historical annual levels of capital funding may result in a decline in the state of repair of rural transit infrastructure. The analyses similarly shows levels of annual funding to maintain the current state of repair through 2028 and to eliminate the annual SGR "backlog," that is, to achieve a national rural transit state of good repair.

Chapter 5 assesses the level of effort and effectiveness of the methodology used to perform the aforementioned SGR analyses. Chapter 5 shows that while the research team believes its analysis is sound, there are nevertheless limitations in the data. In particular, although the NTD was established by Congress in 1978 to serve as the nation's primary source for information and statistics on transit systems of the United States, and continues to serve that function with an ever-expanding register of data, it is prone to errors in reporting by recipients of federal transit funding. Finally, Chapter 6 of this digest summarizes the conclusions of the research and presents observations on the likely future direction of rural public transportation funding.

This digest benefited from informative discussions with the NCHRP Project 20-65/Task 55 panel; representatives of several state DOTs; and FTA staff. The research team met with the panel on November 5, 2013, to gain clarity on the research scope and receive further direction for the overall research approach. The panel reviewed and commented upon the research team's revised work plan and the questions which guided subsequent interviews with select state DOT staff. At the recommendation of the panel, 14 state DOTs were contacted to participate in interviews. Eight accepted, and their observations on the impact of MAP-21 on rural transit systems and state DOT administration of the federal rural transit program are inserted in this digest, as appropriate. Because not all states are equally impacted by the new authorization (and because not all states were interviewed for this research), the information collected through the interviews is only used illustratively. More important to the research was the greater context gained by the research team of some of the nuances of the MAP-21 changes to rural transit. This is particularly true of changes to the Section 5310 program, which was not originally contemplated to be included in the research scope but which became a critical component of it after speaking with several state DOT staff.

The research team also met with several FTA officials from their program management, budget and policy, and safety and oversight offices. FTA provided the research team with the grant program information needed to prepare Chapter 2 of the interim report, as well as a richer understanding of MAP-21 requirements. FTA further provided the team with NTD rural data since 2007 (its first year of publication of rural transit data) as well as a copy of TERM-Lite custom-loaded with rural NTD capital asset data. The NTD data provides the basis for the Chapter 3 analysis, as well as the subsequent needs analysis presented in Chapter 4 of this digest.

The reader should note that this research focuses on public transportation services operated by rural transit providers, including on Indian reservations. Intercity bus is not included; although MAP-21 requires that 15 percent of a state's annual Section 5311 apportionment be used for such service (unless the state can certify that such investment is not necessary). The capital investment needs associated with rural transit service provided by urbanized area operators—a small but increasing segment of service in rural areas—is also excluded. Finally, this research does not address state DOT administration of MAP-21 programs for small urban providers, which significantly changed under the new authorization.

CHAPTER 2 MAP-21 CHANGES

MAP-21 authorizes surface transportation programs for federal fiscal years 2013 and 2014. MAP-21 significantly impacts not only the availability and delivery of federal transit funding to rural areas, but also the requirements that recipients and sub-recipients must meet as a condition of federal aid. This chapter summarizes the following key MAP-21 changes of particular significance to rural operators of public transportation and state DOT administration of the rural transit program:

1. Section 5311 Formula Grants for Rural Areas
2. Section 5311(c)(1) Public Transportation on Indian Reservations
3. Section 5310 Formula Grants for the Enhanced Mobility of Seniors and Individuals with Disabilities
4. Section 5339 Bus and Bus Facilities Program
5. Section 5326 Transit Asset Management
6. Section 5329 Safety

As this research was being performed (October 2013–May 2014), FTA was still in the process of implementing the myriad of MAP-21's changes to the federal transit program, including the statutory provisions noted above and described below. Specifically, in September 2013, FTA published for industry comment proposed revisions to the Section 5311 Formula Grants for Rural Areas Circular. The comment period ended in late November 2013, and FTA has yet to issue final guidance. In October 2013, FTA published an Advance Notice of Proposed Rulemaking (ANPRM) on Safety and Transit Asset Management, which posed 123 questions spanning MAP-21's broad safety and asset management provisions and sought industry input which would inform the development of a Notice of Proposed Rulemaking (NPRM) on the topics. The period for public comment for the ANPRM closed in January 2014. An NPRM is expected in 2015, with a Final Rule anticipated in 2016. Consequently, the following summary is limited to the MAP-21 law itself and FTA guidance issued to date, as found on its MAP-21 webpage (http://www.fta.dot.gov/map21.html).

For MAP-21's grant programs, funding levels are presented, for the most part, alongside those provided for by SAFETEA-LU to demonstrate the changes in the level of federal financial resources available to support rural public transportation. Changes in program formulas and set-asides, the consolidation of programs, the one-time impact of funding under ARRA, and limitations in FTA's tracking of Section 5309 earmarked funds in rural areas allow for an examination of trends but limit an "apples-to-apples" comparison. Additional information on federal, as well as state and local, investment in rural transit is presented in Chapter 3.

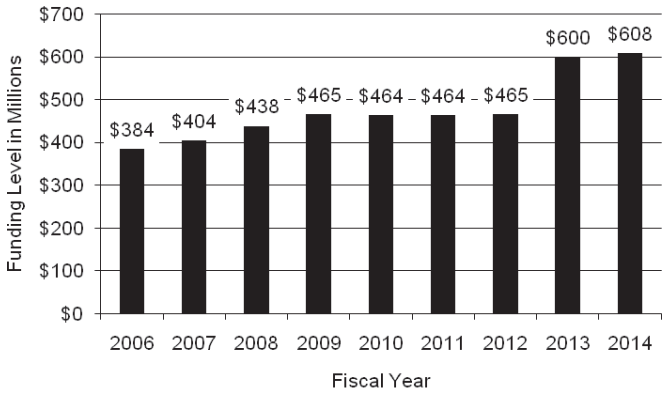
This chapter also presents the observations of representatives from eight state DOTs on the challenges for rural public transit operators and state DOTs to comply with MAP-21 requirements, and on state DOTs administration of the federal rural transit program.

Section 5311 Formula Grants for Rural Areas

MAP-21's revised Section 5311 resulted in changes to the program name from "non-urban" to "rural" (in either definition, an area of less than 50,000 population), overall program funding levels, the formula used to apportion funds to states, program eligibility, and set-asides that support other rural transit programs.

Program Funding Levels

MAP-21 increased formula funding for rural transit operators significantly over levels authorized by SAFETEA-LU. Specifically, MAP-21 represents a 29 percent increase in authorized Section 5311 funding between the last year of SAFETEA-LU in 2009 (with funding levels held relatively constant through 3 years of Congress' extension of the Act) and the first year of the new authorization. Figure 2-1 presents



Source: U.S. Department of Transportation, Federal Transit Administration

Figure 2-1 Authorized Section 5311 program funding levels by year.

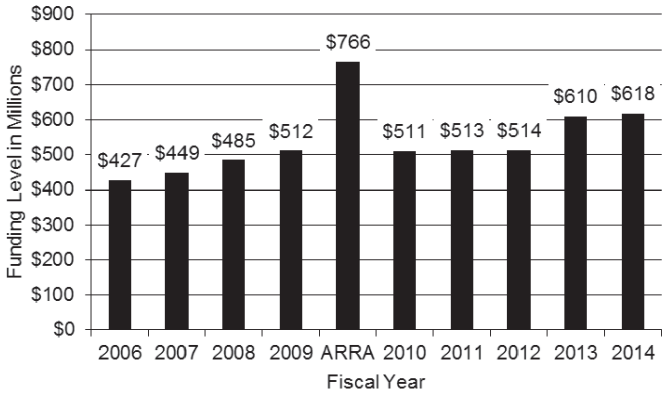
total authorized Section 5311 program funding levels from FY 2006 (the first year of SAFETEA-LU) and FY 2014 (the last year of MAP-21), including all program set-asides.

The totals presented by Figure 2-1 for FY 2013 and 2014 include a new program set-aside for the Appalachian Development Public Transportation Assistance program, a new formularized Grants for Public Transportation on Indian Reservations (Tribal Transit) program, a continued discretionary Tribal Transit program, and the Rural Transit Assistance Program (RTAP). These set-asides are described in greater detail in this chapter.

While MAP-21 increases funding under the Section 5311 program, the annual program growth between FY 2013 and FY 2014 (1.3 percent) is lower than the average annual increases experienced under SAFETEA-LU prior to the 3 years of its extension (6.6 percent).

Both SAFETEA-LU and MAP-21 contain Section 5340, which provides for additional funding, by formula, to growing and high density states. For the purposes of FTA's administration of funds, Section 5340 funding is added to the Section 5311 program (less program set-asides) and apportioned annually by FTA to states as a single amount. Annual appropriated levels of Section 5311/5340 funding are provided in Figure 2-2, which also includes funding that states received for rural transit under ARRA.

Table 2-1 presents this historical funding breakdown by state.



Source: U.S. Department of Transportation, Federal Transit Administration

Figure 2-2 Appropriated Section 5311/5340 program funding levels (including ARRA) by year.

Table 2-1 FY 2006–2014 (including ARRA) of appropriated Section 5311/5340 program funding levels by state (millions).

State	2006	2007	2008	2009	ARRA	2010	2011	2012	2013	2014
Alabama	$11.0	$11.6	$12.6	$13.3	$19.8	$13.3	$13.3	$13.4	$15.3	$15.4
Alaska	$5.0	$5.3	$5.7	$6.0	$9.1	$6.0	$6.1	$6.1	$8.0	$8.1
American Samoa	$0.2	$0.2	$0.2	$0.2	$0.3	$0.2	$0.2	$0.2	$0.3	$0.3
Arizona	$7.9	$8.3	$9.0	$9.5	$14.2	$9.4	$9.5	$9.4	$11.4	$11.6
Arkansas	$8.4	$8.9	$9.6	$10.1	$15.1	$10.1	$10.2	$10.2	$11.8	$12.0
California	$19.3	$20.0	$21.5	$22.7	$34.0	$22.6	$22.7	$22.8	$26.9	$27.5
Colorado	$6.9	$7.3	$7.9	$8.3	$12.5	$8.3	$8.4	$8.4	$10.6	$11.0
Connecticut	$2.3	$2.4	$2.6	$2.7	$4.0	$2.7	$2.7	$2.7	$3.0	$2.9
Delaware	$1.1	$1.1	$1.2	$1.3	$1.9	$1.3	$1.3	$1.3	$1.7	$1.7
District of Columbia	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Florida	$11.4	$12.0	$12.9	$13.6	$20.3	$13.6	$13.6	$13.6	$15.3	$15.6
Georgia	$14.2	$15.1	$16.3	$17.2	$25.6	$17.1	$17.2	$17.1	$20.6	$21.1
Guam	$0.5	$0.5	$0.6	$0.6	$0.9	$0.6	$0.6	$0.6	$0.8	$0.8
Hawaii	$1.6	$1.7	$1.9	$2.0	$2.9	$2.0	$2.0	$2.0	$2.6	$2.7
Idaho	$4.8	$5.1	$5.5	$5.8	$8.7	$5.8	$5.8	$5.8	$7.5	$7.7
Illinois	$11.8	$12.4	$13.4	$14.2	$21.2	$14.1	$14.2	$14.2	$16.1	$16.1
Indiana	$11.3	$11.9	$12.9	$13.6	$20.3	$13.6	$13.6	$13.6	$15.8	$15.9
Iowa	$8.4	$8.9	$9.6	$10.1	$15.2	$10.1	$10.2	$10.2	$12.1	$12.2
Kansas	$7.8	$8.2	$8.9	$9.4	$14.1	$9.4	$9.4	$9.4	$11.0	$10.9
Kentucky	$10.7	$11.3	$12.2	$12.8	$19.2	$12.8	$12.9	$12.9	$16.4	$16.7
Louisiana	$8.6	$8.9	$9.6	$10.2	$15.3	$10.2	$10.3	$10.3	$11.2	$11.4

(*continued on next page*)

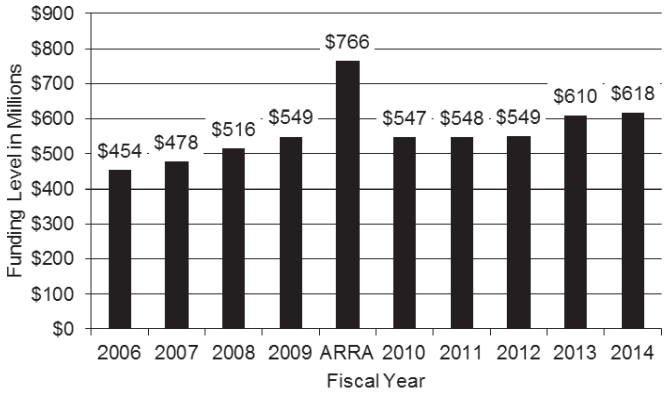
Table 2-1 (Continued)

State	2006	2007	2008	2009	ARRA	2010	2011	2012	2013	2014
Maine	$4.5	$4.8	$5.1	$5.4	$8.1	$5.4	$5.4	$5.4	$7.0	$6.8
Maryland	$4.2	$4.4	$4.7	$5.0	$7.4	$5.0	$5.0	$5.0	$5.6	$5.5
Massachusetts	$2.9	$3.1	$3.3	$3.5	$5.2	$3.5	$3.5	$3.5	$3.6	$3.6
Michigan	$14.5	$15.2	$16.4	$17.2	$25.8	$17.2	$17.3	$17.2	$20.8	$20.6
Minnesota	$10.6	$11.2	$12.1	$12.7	$19.0	$12.7	$12.8	$12.8	$15.3	$15.4
Mississippi	$9.6	$10.1	$10.9	$11.5	$17.3	$11.5	$11.6	$11.6	$13.9	$14.0
Missouri	$11.5	$12.2	$13.1	$13.8	$20.7	$13.8	$13.9	$13.9	$17.3	$17.5
Montana	$6.3	$6.6	$7.1	$7.5	$11.3	$7.5	$7.5	$7.6	$9.8	$10.0
N. Mariana Islands	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0	$0.3	$0.3
Nebraska	$5.5	$5.8	$6.2	$6.5	$9.8	$6.5	$6.6	$6.6	$7.6	$7.6
Nevada	$4.1	$4.3	$4.7	$4.9	$7.4	$4.9	$4.9	$4.9	$6.3	$6.4
New Hampshire	$2.9	$3.1	$3.3	$3.5	$5.2	$3.5	$3.5	$3.5	$3.9	$3.9
New Jersey	$2.7	$2.9	$3.1	$3.2	$4.8	$3.2	$3.2	$3.2	$4.0	$3.8
New Mexico	$6.8	$7.2	$7.8	$8.2	$12.3	$8.2	$8.2	$8.2	$10.2	$10.3
New York	$14.6	$15.4	$16.6	$17.5	$26.3	$17.5	$17.6	$17.6	$20.0	$20.5
North Carolina	$18.3	$19.3	$20.9	$22.1	$33.1	$22.1	$22.2	$22.2	$25.8	$26.5
North Dakota	$3.3	$3.5	$3.8	$4.0	$6.0	$4.0	$4.0	$4.0	$5.0	$5.1
Ohio	$16.6	$17.5	$18.9	$19.9	$29.8	$19.9	$20.0	$20.0	$22.8	$22.8
Oklahoma	$9.4	$9.9	$10.7	$11.3	$16.9	$11.3	$11.4	$11.4	$14.5	$14.7
Oregon	$8.1	$8.6	$9.3	$9.8	$14.6	$9.8	$9.8	$9.8	$11.8	$11.9
Pennsylvania	$16.8	$17.7	$19.1	$20.2	$30.2	$20.2	$20.3	$20.3	$21.5	$21.5
Puerto Rico	$1.2	$1.2	$1.3	$1.4	$2.1	$1.4	$1.4	$1.4	$1.9	$1.9
Rhode Island	$0.5	$0.5	$0.5	$0.6	$0.9	$0.6	$0.6	$0.6	$0.6	$0.8
South Carolina	$9.2	$9.7	$10.5	$11.1	$16.6	$11.1	$11.1	$11.2	$12.4	$12.8
South Dakota	$4.1	$4.3	$4.7	$4.9	$7.4	$4.9	$4.9	$4.9	$6.2	$6.4
Tennessee	$11.7	$12.4	$13.4	$14.2	$21.2	$14.1	$14.2	$14.2	$18.2	$18.5
Texas	$28.1	$29.7	$32.0	$33.8	$50.6	$33.8	$33.9	$34.0	$40.0	$40.9
Utah	$4.0	$4.2	$4.6	$4.8	$7.3	$4.8	$4.8	$4.8	$6.2	$6.2
Vermont	$2.2	$2.3	$2.5	$2.6	$3.9	$2.6	$2.6	$2.6	$3.4	$3.5
Virgin Islands	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Virginia	$10.4	$10.9	$11.8	$12.4	$18.6	$12.4	$12.4	$12.5	$14.5	$15.0
Washington	$7.9	$8.4	$9.1	$9.6	$14.3	$9.6	$9.6	$9.6	$12.2	$12.4
West Virginia	$5.6	$5.9	$6.4	$6.7	$10.1	$6.7	$6.7	$6.8	$7.7	$7.7
Wisconsin	$11.2	$11.8	$12.7	$13.5	$20.1	$13.4	$13.5	$13.5	$15.5	$15.5
Wyoming	$3.9	$4.1	$4.4	$4.7	$7.0	$4.7	$4.7	$4.7	$6.2	$6.3
Total	**$426.5**	**$449.4**	**$484.8**	**$511.7**	**$765.8**	**$511.3**	**$513.2**	**$513.6**	**$610.4**	**$618.4**

SOURCE: U.S. Department of Transportation, Federal Transit Administration.

While formula funding under MAP-21 appears to grow significantly for rural transit, MAP-21 repeals SAFETEA-LU's Section 5316 Job Access and Reverse Commute (JARC) program while making activities previously funded under JARC an eligible expense of the Section 5311 program. Under SAFETEA-LU, a portion of these funds were apportioned by formula to state DOTs to fund eligible activities in rural areas. Consequently, part of the growth in the MAP-21 Section 5311 program reflects the absorption of JARC into it. Figure 2-3 provides the combined total of Section 5311, Section 5340, and Section 5316 funding available for use in rural areas between fiscal years 2006 and 2012, and the comparable figure for the MAP-21 Section 5311 for FY 2013 and 2014 program.

Figure 2-3 shows that when factoring in this consolidation of JARC into the Section 5311 program, the 29 percent growth in the rural formula program presented between SAFETEA-LU and MAP-21 (as shown in Figure 2-2) is actually only 11 percent.



Source: U.S. Department of Transportation, Federal Transit Administration

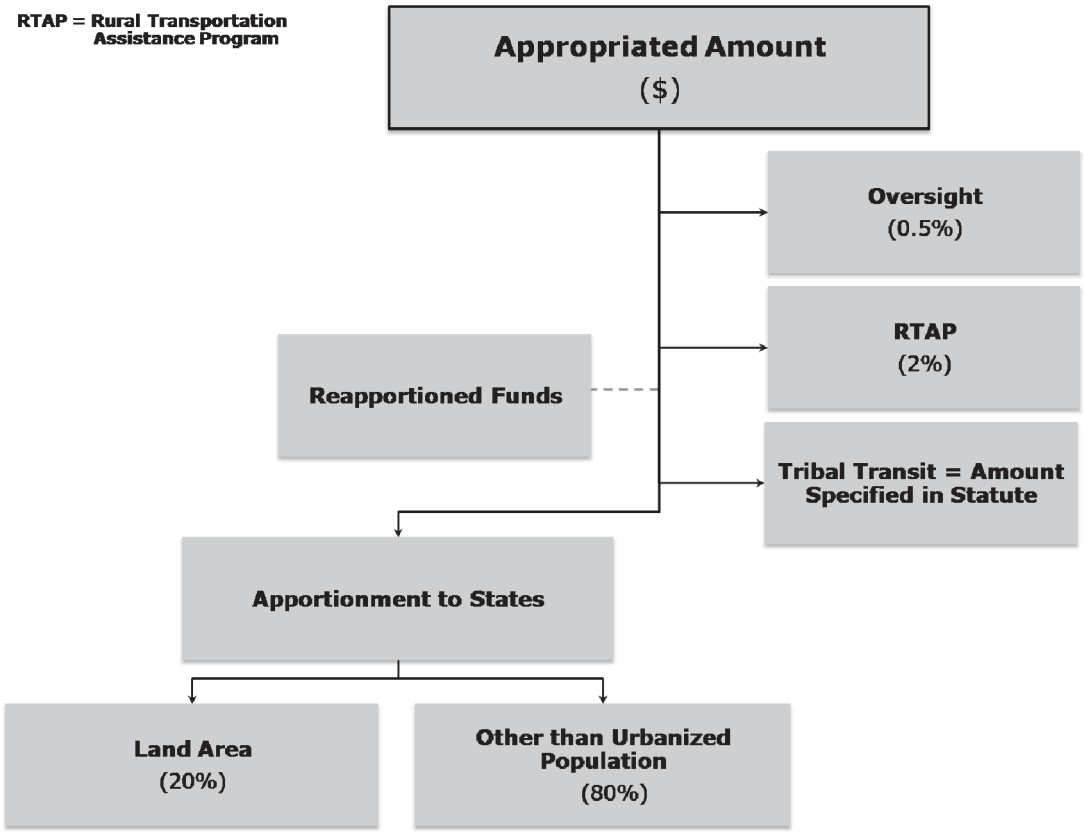
Figure 2-3 Appropriated Section 5311/5340 and JARC funding levels (with ARRA) by year.

Program Formula

SAFETEA-LU's formula for allocating Section 5311 resources was simple: 80 percent of funds were allocated on the basis of the non-urbanized population of each state, with the remaining 20 percent of the program allocated based on states' non-urbanized land area. The SAFETEA-LU formula is presented in Figure 2-4.

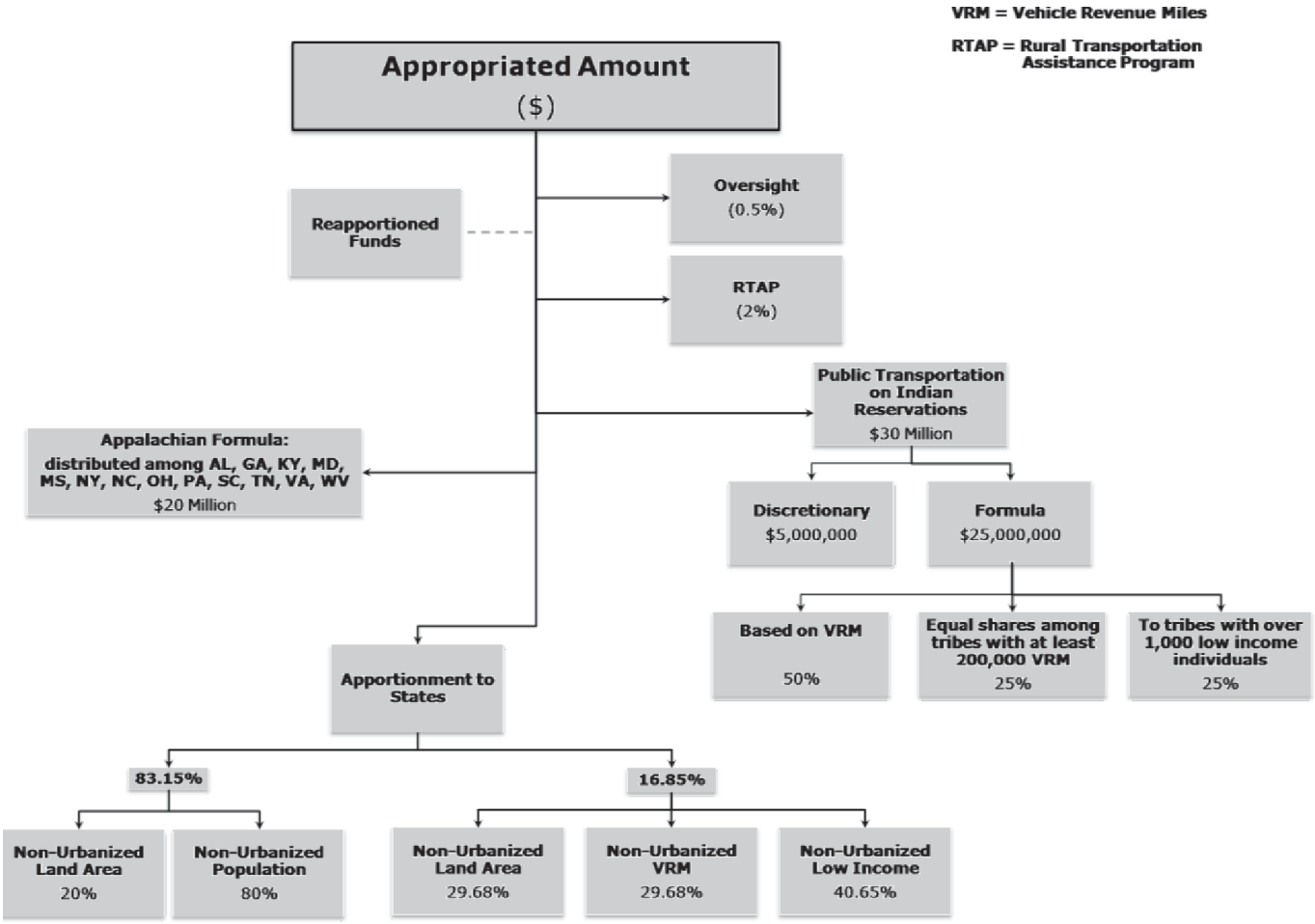
MAP-21 modifies the formula for allocating the Section 5311 Rural Formula program to each state. For the first time, rural transit data collected by state DOTs and reported to NTD is being used in the Section 5311 program allocation formula. Specifically, 83.15 percent of available funds are apportioned consistent with SAFETEA-LU's formula, while 16.85 percent are apportioned on the basis of land area, vehicle revenue miles, and the number of low-income individuals in rural areas (the last two factors in response to the incorporation of JARC-eligible activities into the Section 5311 program). Figure 2-5 presents MAP-21's Section 5311 formula.

Table 2-2 presents the annual Section 5311 apportionment, by state (without any set-asides or Section 5340 amounts), for the last year of use of the SAFETEA-LU formula (FY 2012) and the first year that FTA applied the MAP-21 rural area transit program formula (FY 2013). Table 2-2 also presents the percentage change for each state.



Source: U.S. Department of Transportation, Federal Transit Administration

Figure 2-4 SAFETEA-LU Section 5311 formula.



Source: U.S. Department of Transportation, Federal Transit Administration

Figure 2-5 MAP-21 Section 5311 formula.

Table 2-2 FY 2012–2013 Section 5311 apportionments by state ($).

State	FY 2012	FY 2013	Percent Change (%)
Alabama	11,339,092	13,165,690	16.1
Alaska	5,773,674	7,597,313	31.6
American Samoa	227,555	302,363	32.9
Arizona	8,184,154	10,239,261	25.1
Arkansas	8,676,220	10,323,355	19.0
California	19,546,666	23,621,124	20.8
Colorado	7,365,107	9,595,724	30.3
Connecticut	2,286,516	2,497,204	9.2
Delaware	1,045,141	1,424,414	36.3
District of Columbia	—	—	—
Florida	11,333,568	13,245,078	16.9
Georgia	14,139,891	17,669,919	25.0
Guam	615,073	781,609	27.1
Hawaii	1,664,341	2,240,357	34.6
Idaho	5,191,629	6,844,047	31.8
Illinois	12,128,807	13,910,174	14.7

Table 2-2 (Continued)

State	FY 2012	FY 2013	Percent Change (%)
Indiana	11,524,415	13,566,430	17.7
Iowa	8,788,016	10,561,769	20.2
Kansas	8,264,692	9,722,237	17.6
Kentucky	10,903,956	14,224,214	30.5
Louisiana	8,875,914	9,719,697	9.5
Maine	4,699,899	6,175,510	31.4
Maryland	4,174,800	4,813,885	15.3
Massachusetts	2,962,878	3,064,048	3.4
Michigan	14,834,691	17,951,071	21.0
Minnesota	10,981,282	13,328,726	21.4
Mississippi	9,908,701	12,040,445	21.5
Missouri	11,879,189	15,123,628	27.3
Montana	6,996,474	9,174,154	31.1
N. Mariana Islands	35,031	290,368	728.9
Nebraska	5,864,240	6,815,924	16.2
Nevada	4,552,692	5,960,384	30.9
New Hampshire	2,946,439	3,315,370	12.5
New Jersey	2,740,336	3,425,163	25.0
New Mexico	7,396,227	9,310,652	25.9
New York	14,971,595	17,111,463	14.3
North Carolina	18,249,516	22,056,094	20.9
North Dakota	3,687,665	4,633,849	25.7
Ohio	17,028,640	19,416,568	14.0
Oklahoma	9,777,409	12,705,584	29.9
Oregon	8,548,281	10,571,847	23.7
Pennsylvania	17,246,488	18,329,652	6.3
Puerto Rico	1,408,019	1,877,956	33.4
Rhode Island	492,966	476,937	(3.3)
South Carolina	9,271,494	10,600,348	14.3
South Dakota	4,480,592	5,726,856	27.8
Tennessee	11,896,107	15,695,321	31.9
Texas	28,212,766	34,556,443	22.5
Utah	4,358,385	5,694,853	30.7
Vermont	2,255,694	3,001,996	33.1
Virgin Islands	—	—	—
Virginia	10,430,138	12,430,803	19.2
Washington	8,199,876	10,725,884	30.8
West Virginia	5,799,047	6,653,804	14.7
Wisconsin	11,511,284	13,360,059	16.1
Wyoming	4,362,075	5,775,853	32.4
Total	**440,035,343**	**533,443,475**	**21.2**

SOURCE: U.S. Department of Transportation, Federal Transit Administration.

Table 2-2 shows a dramatic increase in funding for several smaller states, most notably Delaware, Hawaii, Puerto Rico, and Vermont. The Northern Marianna Islands experienced a 733 percent growth in funding between SAFETEA-LU and MAP-21, although the increase was less than $260,000. Another small—but dense—state, Rhode Island, was the only state to suffer a reduction in funding.

Note that these differences reflect not only different program funding levels and distribution formulas, but the first-time application (in FY 2013) of Census 2010 population data. Table 2-3 contains

Table 2-3 FY 2012–2013 Section 5311 apportionments by state using 2000 Census data ($).

State	FY 2012 (w/2000 Census data)	FY 2013 (w/2010 Census data)	FY 2013 (w/2000 Census data)	Change in Apportionment	Percent Change (%)
Alabama	11,339,092	13,165,690	13,420,741	(255,051)	–1.9%
Alaska	5,773,674	7,597,313	7,422,007	175,306	2.3%
American Samoa	227,555	302,363	340,279	(37,916)	–12.5%
Arizona	8,184,154	10,239,261	10,138,897	100,364	1.0%
Arkansas	8,676,220	10,323,355	10,529,085	(205,730)	–2.0%
California	19,546,666	23,621,124	24,024,987	(403,863)	–1.7%
Colorado	7,365,107	9,595,724	9,230,911	364,813	3.8%
Connecticut	2,286,516	2,497,204	2,509,258	(12,055)	–0.5%
Delaware	1,045,141	1,424,414	1,308,728	115,685	8.1%
District of Columbia	—	—	—	—	0.0%
Florida	11,333,568	13,245,078	13,984,281	(739,203)	–5.6%
Georgia	14,139,891	17,669,919	16,988,583	681,336	3.9%
Guam	615,073	781,609	784,121	(2,512)	–0.3%
Hawaii	1,664,341	2,240,357	2,229,808	10,549	0.5%
Idaho	5,191,629	6,844,047	6,475,866	368,181	5.4%
Illinois	12,128,807	13,910,174	14,254,783	(344,609)	–2.5%
Indiana	11,524,415	13,566,430	13,376,866	189,564	1.4%
Iowa	8,788,016	10,561,769	10,601,871	(40,103)	–0.4%
Kansas	8,264,692	9,722,237	9,942,428	(220,191)	–2.3%
Kentucky	10,903,956	14,224,214	13,985,051	239,164	1.7%
Louisiana	8,875,914	9,719,697	10,741,161	(1,021,464)	–10.5%
Maine	4,699,899	6,175,510	6,073,998	101,512	1.6%
Maryland	4,174,800	4,813,885	5,008,617	(194,732)	–4.0%
Massachusetts	2,962,878	3,064,048	3,345,203	(281,155)	–9.2%
Michigan	14,834,691	17,951,071	17,706,544	244,527	1.4%
Minnesota	10,981,282	13,328,726	13,097,694	231,032	1.7%
Mississippi	9,908,701	12,040,445	12,183,403	(142,958)	–1.2%
Missouri	11,879,189	15,123,628	14,770,938	352,689	2.3%
Montana	6,996,474	9,174,154	8,919,973	254,181	2.8%
N. Mariana Islands	35,031	290,368	99,663	190,705	65.7%
Nebraska	5,864,240	6,815,924	7,076,610	(260,686)	–3.8%
Nevada	4,552,692	5,960,384	5,746,166	214,217	3.6%
New Hampshire	2,946,439	3,315,370	3,267,655	47,714	1.4%
New Jersey	2,740,336	3,425,163	3,285,992	139,171	4.1%
New Mexico	7,396,227	9,310,652	9,435,646	(124,994)	–1.3%
New York	14,971,595	17,111,463	17,420,901	(309,437)	–1.8%
North Carolina	18,249,516	22,056,094	21,998,622	57,472	0.3%
North Dakota	3,687,665	4,633,849	4,675,997	(42,149)	–0.9%
Ohio	17,028,640	19,416,568	19,256,985	159,583	0.8%
Oklahoma	9,777,409	12,705,584	12,484,965	220,619	1.7%
Oregon	8,548,281	10,571,847	10,499,750	72,097	0.7%
Pennsylvania	17,246,488	18,329,652	19,730,251	(1,400,599)	–7.6%
Puerto Rico	1,408,019	1,877,956	1,912,522	(34,566)	–1.8%
Rhode Island	492,966	476,937	542,374	(65,437)	–13.7%
South Carolina	9,271,494	10,600,348	11,079,414	(479,066)	–4.5%
South Dakota	4,480,592	5,726,856	5,701,150	25,706	0.4%
Tennessee	11,896,107	15,695,321	14,878,644	816,676	5.2%
Texas	28,212,766	34,556,443	34,004,769	551,674	1.6%
Utah	4,358,385	5,694,853	5,549,104	145,749	2.6%

Table 2-3 (Continued)

State	FY 2012 (w/2000 Census data)	FY 2013 (w/2010 Census data)	FY 2013 (w/2000 Census data)	Change in Apportionment	Percent Change (%)
Vermont	2,255,694	3,001,996	2,941,268	60,729	2.0%
Virgin Islands	—	—	—	—	0.0%
Virginia	10,430,138	12,430,803	12,375,342	55,461	0.4%
Washington	8,199,876	10,725,884	10,394,539	331,345	3.1%
West Virginia	5,799,047	6,653,804	6,989,502	(335,698)	–5.0%
Wisconsin	11,511,284	13,360,059	13,162,742	197,317	1.5%
Wyoming	4,362,075	5,775,853	5,536,818	239,034	4.1%
Total	**440,035,343**	**533,443,475**	**533,443,475**		

SOURCE: U.S. Department of Transportation, Federal Transit Administration.

a hypothetical application of the MAP-21 Section 5311 formula to the 2000 U.S. Census data to better understand the impacts of the new formula versus population growth on each state's annual apportionment. Table 2-3 suggests that population growth resulted in relatively modest impacts to most state apportionments. However, Delaware received over 8 percent more of what it would have received using the 2000 Census data, while Tennessee gained over $800,000 in program funding. Both Pennsylvania and Louisiana forwent over $1 million in funding because of the change to the use of 2010 Census data. Rhode Island lost the most in terms of percentage of its apportionment.

Eligibility

MAP-21 expands the types of activities that the Section 5311 program may fund. In addition to its use for capital and operating purposes, rural operators may now use Section 5311 funds for planning. Planning remains an eligible expense for state DOTs as part of the portion of each state's program which may be set aside for administrative purposes. However, MAP-21 reduces the maximum amount of this set-aside for each state from 15 percent to 10 percent. Administrative activities under this set-aside—which also include planning and technical assistance—do not require local match.

Only two of the state DOT representatives interviewed for the research reported that these changes will have any impact on how they intend to use their Section 5311 resources, stating that their use of Section 5311 funding for administration typically did not exceed 10 percent on an annual basis, and that planning activities, when performed, were most often funded under the Section 5304 Statewide Planning program and would continue to be so. However, one DOT official ranked this change as the most significant challenge for administering a statewide rural transit program created by MAP-21.

As noted previously, activities eligible under SAFETEA-LU's JARC program are now eligible under the Section 5311 program. Most state DOT representatives reported that the elimination of JARC relieves some administrative burden, and a few officials noted the difficulty their states have had in the past in finding eligible JARC projects. Another DOT representative believed that because overall federal formula and discretionary funding declined under MAP-21, JARC-like projects would likely be the first to be cut.

Finally, MAP-21 provides for up to 0.5 percent of a state's Section 5311 apportionment to be used for the cost of training employees who are responsible for safety oversight, including participation in public transportation safety certification training. State DOTs reported that it was too early to anticipate the impacts of this provision, with many acknowledging that they were not even aware of it.

Program Set-Asides

MAP-21 establishes three sub-programs or "set-asides" whereby a set percentage of the Section 5311 program is reserved for a specific set of recipients. These take-downs include the Formula and Discretionary Grants for Public Transportation on Indian Reservations (Tribal Transit) program, the Appalachian Development Public Transportation Assistance program, and RTAP. The Appalachian Development Public Transportation Assistance program and

RTAP are described in the following paragraphs. The Tribal Transit program is described in its own subsection.

Appalachian Development Public Transportation Assistance Program. The Appalachian Development Public Transportation Assistance program is a new take-down under the Section 5311 program. MAP-21 authorizes $20 million of funding for 16 states that constitute the Appalachian Development region. FTA apportions funds to these states based on each state's remaining estimated need to complete eligible sections of the Appalachian Development Highway System. Allocations under this program in FY 2013 ranged from less than $200,000 for New York and South Carolina to just under $5 million for Alabama. These funds may be used for any eligible purpose under the Section 5311 program within the boundaries of the Appalachian Development region, or, under certain circumstances, can be transferred for highway purposes within the region, pending FTA guidance.

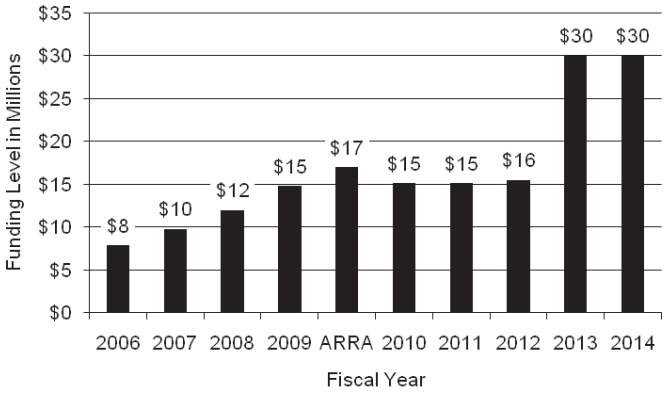
Rural Transit Assistance Program. MAP-21 continues RTAP as a 2 percent take-down from the Section 5311 program, of which 15 percent of this amount is reserved for the national RTAP. RTAP provides funding for training, technical assistance, research, and other support services to meet the needs of transit operators in rural areas. MAP-21 makes no changes to the program.

Intercity Bus Transportation Program

MAP-21 maintains the requirement that each state expend at least 15 percent of its annual Rural Formula program apportionment on intercity bus transportation, unless it can certify that intercity bus needs are being met without this level of investment. However, MAP-21 puts into law an FTA pilot program that permits the cost of an unsubsidized portion of privately provided intercity bus service that connects to feeder service to be used as in-kind local match for intercity bus projects.

Tribal Transit Program

MAP-21 maintains SAFETEA-LU's Tribal Transit program, but increases its funding to $30 million annually, $25 million of which is to be administered by formula and $5 million by FTA discretion.



Source: U.S. Department of Transportation, Federal Transit Administration

Figure 2-6 Authorized funding levels of the Tribal Transit program by year.

Figure 2-6 presents authorized funding levels of the Tribal Transit program over the periods of SAFETEA-LU and MAP-21.

The Tribal Transit formula within the overall Section 5311 program consists of the following "tiers":

- Tier 1: 50% based on vehicle revenue miles
- Tier 2: 25% based on Tribes providing at least 200,000 vehicle revenue miles
- Tier 3: 25% based on Tribes providing public transportation on land where more than 1,000 low-income individuals reside

Tribal Transit program activities remain eligible under the Section 5311 program.

State DOT officials interviewed for this research that had tribes in their states indicated that they welcome the formularization of the program because it provides a more reliable revenue stream for planning purposes.

Section 5310 Formula Grants for the Enhanced Mobility of Seniors and Individuals with Disabilities

Although not a "rural" program, MAP-21's revised Section 5310 results in a significant impact to the use of federal funding for transit services in rural areas that serve seniors and disabled passengers. MAP-21's Section 5310 resulted in the replacement of the term "special needs of elderly individuals" to "the enhanced mobility of seniors." It also (1) absorbs SAFETEA-LU's Section 5317 New Freedom program, which was repealed by MAP-21,

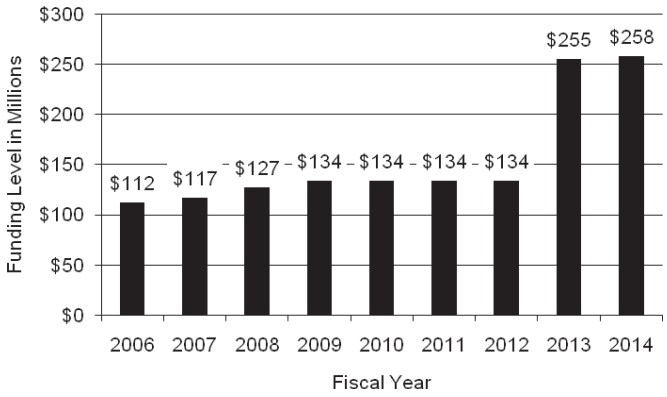
(2) provides for the use of a portion of program funds for operating assistance, and (3) apportions funds to specific urbanized and rural areas based on the number of seniors and individuals with disabilities in those areas. This last change is a dramatic departure because SAFETEA-LU formerly allocated funds to state DOTs based on each state's senior and disabled population for use anywhere in the state.

Program Funding Levels

MAP-21 increased funding available under the Section 5310 Enhanced Mobility program. This partially reflects the absorption of New Freedom program activities. Figure 2-7 presents Section 5310 program levels authorized under SAFETEA-LU and MAP-21.

Under SAFETEA-LU, the Section 5310 program was allocated by formula directly to state DOTs based on the number of elderly individuals and individuals with disabilities within each state. These funds could be used anywhere in the state. MAP-21 now apportions 60 percent of program funding to urbanized areas with a population over 200,000; 20 percent to urbanized areas of between 50,000 and 200,000 population; and 20 percent to state DOTs for rural areas. In 2013, FTA apportioned $51,383,807 of Section 5310 program funding for use in rural areas.

According to many of the state DOT officials interviewed for this research, the MAP-21 distribution plan negatively impacts rural transit providers, because a large portion of Section 5310 funds were typically used in rural areas.



Source: U.S. Department of Transportation, Federal Transit Administration

Figure 2-7 Authorized funding levels for Section 5310 program by year.

Eligibility

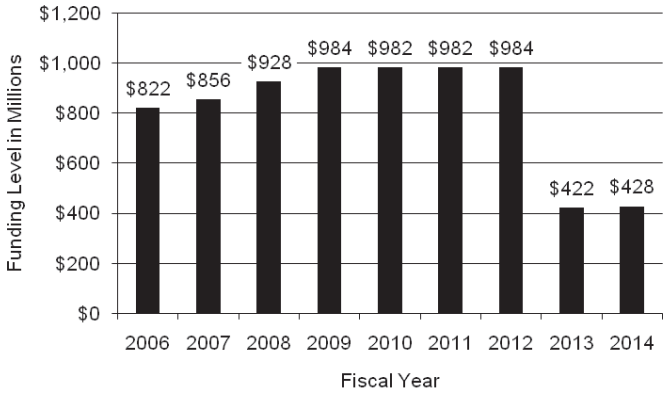
MAP-21 expands eligibility of Section 5310 funds to be used for operating transportation services that address the needs of seniors and individuals with disabilities. Reflecting the absorption of the New Freedom program, MAP-21 permits up to 45 percent of a recipients' funding to be used for public transportation projects that exceed the requirements of the Americans with Disabilities Act (ADA); public transportation projects that improve access to fixed-route service and decrease reliance by individuals with disabilities on complementary paratransit; or alternatives to public transportation that assist seniors and individuals with disabilities. At least 55 percent of program funds available for this program must be used on projects planned, designed, and carried out to meet the special needs of seniors and individuals with disabilities when public transportation is insufficient, inappropriate, or unavailable, typically carried out by non-profit agencies. The acquisition of public transportation services is an eligible expense under the program.

Section 5339 Bus and Bus Facilities Program

Section 5339 replaces SAFETEA-LU's discretionary Section 5309 Bus and Bus Facilities program. MAP-21 authorizes $422 million in FY 2013 and $427.8 million in FY 2014 for the Section 5339 program. Each year $65.5 million of funding—an average of 15.4 percent of the total annual Section 5339 program—is allocated to states and territories for capital funding to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. Within this amount, each state receives $1.25 million annually, with territories (including Washington, D.C. and Puerto Rico) receiving $500,000 each year. Remaining program funds are apportioned by formula to urbanized areas.

MAP-21 permits states to transfer their Section 5339 allocation to either the Section 5311 program for use in rural areas or the Section 5307 program for use in urbanized areas.

In contrast, SAFETEA-LU required that no less than 5.5 percent of the annual Section 5309 Bus and Bus Facilities program shall be available for projects in non-urbanized areas. As shown in Chapter 3, the actual amount of Section 5309 program funding obligated in rural areas is difficult to determine. In



Source: U.S. Department of Transportation, Federal Transit Administration

Figure 2-8 Authorized funding levels for Section 5309-5339 program by year.

terms of *overall* levels, however, the Section 5339 program represents a sharp decrease in resources as compared with SAFETEA-LU's Section 5309 Bus and Bus Related Facilities discretionary program, as shown in Figure 2-8.

Many of the state DOT officials interviewed for this research stated that the repeal of the Section 5309 Bus and Bus Facilities program has and will likely continue to adversely impact rural transit service. Many rural transit systems relied on Section 5309 funding for capital projects, permitting state DOTs to use the majority of Section 5311 program funding for operating assistance. With the loss of the Section 5309 program, many state DOT staff stated that more Section 5311 funding may be required for capital purchases, making less available for operations. Section 5309 program funding was also often used for larger capital acquisitions, like maintenance facilities, which were not possible with the small amount of funds typically made available to individual transit operators from the Section 5311 program.

On the other hand, representatives from two state DOTs noted that rural systems in their states rarely received Section 5309 Bus "earmarks," and that the Section 5339 program, though small, provides a steady and reliable source of revenue. An analysis of Section 5309 and Section 5339 funding made available for rural transit services is presented in Chapter 3.

Section 5326 Transit Asset Management

MAP-21 establishes, for the first time, a national transit asset management (TAM) system. Section 5326(b) requires that the national TAM system include a definition of the "state of good repair" that defines standards and performance measures for adequate maintenance of transit capital assets; provides for decision support tools to assist transit operators in estimating their capital reinvestment needs and prioritizing their investments; and delivers technical assistance to FTA grantees.

The national transit asset management system also requires the following:

- Recipients and sub-recipients of any federal transit assistance program—including Sections 5311 and 5339—must develop their own asset management plans.
- Recipients (but not sub-recipients) must develop performance targets in relation to the performance measures defined in the national TAM system.
- Designated recipients must report annually on the condition of their "system" and their progress toward meeting performance targets, as well as performance targets for the subsequent year.

FTA has published research on good asset management practices; has funded (with FY 2011 and 2012 Section 5309 Bus and Bus Facilities resources) asset management systems for several grantees; and is piloting new systems at several other transit agencies. FTA has also issued a white paper titled *Defining the State of Good Repair*, which details four approaches to measuring the condition of transit capital assets. However, FTA has not yet provided interim guidance on MAP-21's asset management requirements. As noted earlier, FTA issued an ANPRM on Transit Asset Management (and Safety) in October 2013. The ANPRM is the first step in a regulatory process that will not likely be completed until 2015.

The ANPRM does contemplate the need to set asset management requirements that are commensurate with the size of affected transit systems. According to the NPRM, FTA desires

> *"to be sensitive to the needs of small transit operators . . . in particular, FTA notes that most small transit systems have already developed a detailed asset inventory for revenue vehicles in order to meet their NTD reporting requirements. This may allow FTA to set simpler TAM Plan requirements for small systems that would require assembling asset inventory information for assets other than revenue vehicles, and then also creating an investment prioritization."*

Later, the ANPRM states that *"smaller organizations may be permitted to take a simpler approach in developing an investment prioritization based on asset inventory information that is already largely on-hand."*

Nonetheless, many state DOT staff interviewed were concerned about the potential magnitude of MAP-21's asset management requirements on rural operators. No state DOT interviewed currently requires that its Section 5311 and other federal funding sub-recipients maintain a TAM system, although all require some sort of maintenance plan. One state DOT provided asset management training to its operators. While a few state DOT officials stated that they possessed statewide asset management systems, most tracked little more than the age and mileage of vehicles, and doubled as the repository for sub-recipient NTD reporting.

On the other hand, some state DOT officials stated that they welcomed the new requirement. One said that a federal asset management requirement gives credibility to recent efforts undertaken by the state DOT to implement such systems at the operator level. Others believed that FTA's requirements would not be difficult to meet, at least at first. One State DOT official noted that in the absence of a regulation or any binding guidance, the requirement would not take effect.

Section 5329 Public Transportation Safety Program

MAP-21 also establishes for the first time a national public transportation safety program. The public transportation safety program places new requirements on all recipients (and sub-recipients) of Section 5311 program funds to develop and implement safety plans, and for state DOTs to play a role in their development and certification.

More specifically, MAP-21 Section 5329(d) requires that each "recipient or state" prepare a Public Transportation Agency Safety Plan. These plans must include the following, at a minimum:

- A requirement that the board of directors, or equivalent entity, approve the Transit Agency Safety Plan and any updates to the plan;
- Methods for identifying and evaluating safety risks throughout all elements of the recipient's public transportation system;
- Strategies to minimize the exposure of the public, personnel, and property to hazards and unsafe conditions;
- A process and timeline for conducting an annual review and update of the plan;
- Performance targets based on the safety performance criteria and state of good repair standards set out in the National Safety Plan;
- Assignment of an adequately trained safety officer who reports directly to the general manager, president, or equivalent officer of the recipient; and
- A comprehensive staff training program for the operations personnel and personnel directly responsible for safety.

FTA has interpreted the MAP-21 requirement to prepare a Section 5329(d)-compliant agency safety plan as applicable to sub-recipients of Section 5311 funding. MAP-21 further establishes that rural transit agencies may have their plans drafted and certified by the state, while "small public transportation providers" under Section 5307 may also have their safety plans drafted or certified by a state, pending FTA regulation.

These plans will be due 1 year after FTA issues a final rule on Safety, anticipated in 2015. Similar to asset management systems, MAP-21 provides no specific funding for state DOTs or rural transit operators to develop and implement a federally compliant Public Transportation Agency Safety Plan.

Most state DOTs interviewed for this research held the same concerns with MAP-21's safety requirements as they did with requirements for transit asset management plans. Most of the officials said their DOTs recommend that their rural transit systems develop safety plans, but do not require them. Some that do require operator-level agency plans described their plans as focusing on emergency management. One DOT noted that it was a state law for any transit agency recipient of state Section 5311 program funds to have a safety plan.

Another state DOT official noted particular concern about the Safety Management System approach that FTA is promoting, fearing that it will be cost-prohibitive for small transit agencies to implement. Two others worried that state DOTs—who in all but a few states are not themselves operators of public transportation service—have been put in a position to develop and certify safety plans on behalf of small providers. Most state DOTs do not currently

have the resources or expertise to perform such a function, although state DOTs charged with overseeing urban rail transit acting as its State Safety Oversight agency may be better prepared.

CHAPTER 3 RURAL TRANSIT PERFORMANCE AND INVESTMENT TRENDS

This chapter presents trends in the investment and performance profile of the nation's rural transit systems since FY 2006 (report year 2007), the first year of SAFETEA-LU and the first year of state DOT reporting of rural transit data to the NTD. Specifically, this chapter summarizes the sources and uses of rural transit funding over the period of analysis as well as the productivity of the rural transit investment in terms of ridership, service levels, and costs. Ultimately, this chapter provides the historical context against which future investment needs for rural transit infrastructure are estimated, as presented in Chapter 4.

National Transit Database (NTD)

Except where noted, the following analysis is based on data reported annually to FTA's NTD. The NTD was established by Congress as the nation's primary source for information and statistics on the nation's public transit systems. Recipients of FTA Section 5307 Urbanized Area Formula program grants have been reporting to the NTD since 1979. Beginning in 2006 with the passage of SAFETEA-LU, state DOT recipients of Section 5311 Rural Formula program funds are required to report rural transit data annually to the NTD. States collect this information from each of their rural transit sub-recipients. According to MAP-21 Section 5311 (b)(4), the following data must be submitted to FTA via the NTD each year:

a. total annual revenue
b. sources of revenue
c. total annual operating costs
d. total annual capital costs
e. fleet size and type, and related facilities
f. vehicle revenue miles
g. ridership

A state must submit data to the NTD for any Section 5311 sub-recipient throughout the minimum useful life of any capital asset purchased with Section 5311 funds. This means that a state may be required to provide reports on Section 5311 sub-recipients that did not receive any Rural Formula funds during the current reporting year so long as they have not disposed of any assets before the end of their useful life. Additionally, states are required to report to the NTD for any prior-year Section 5311 program sub-recipients who are expected to receive Section 5311 grant funds in the future. Depending on the beginning and ending date of each state DOT's fiscal year, the NTD reflects data that is 9 to 15 months old at the time of its publication. The 2012 data, which is the most recent available and the data used for this analysis, was subject to FTA's NTD review and validation and was published in October 2013. This data was subsequently used for FTA's FY 2014 formula apportionments.

Indian tribes that receive the Section 5311 set-aside for Tribal Transit grants, and urbanized area transit operators who provide service to rural areas (and who may also receive Section 5311 funding) report directly to the NTD.

The NTD captures data on amounts and sources of revenue for both capital and operating purposes. It was not the research team's original intent to use the NTD for the analysis of Section 5309 Bus and Bus Facilities funding made available to rural operators from 2007–2012; rather, it was the team's assumption that FTA's grants management system, TEAM, would be able to provide this data. However, after several discussions with FTA grants management staff, it was determined that this approach was not possible. According to FTA, the agency has no easy way (e.g., query in TEAM or other database) to distinguish the Section 5309 funds that were obligated to a state DOT for use in a rural, as opposed to an urbanized, area. While many rural areas prior to MAP-21 received Section 5309 program funding under a statewide earmark obligated to their state DOT, not all funds may have been sub-allocated to rural transit systems. In fact, FTA's long-standing annual grant statistical summaries have erroneously reported that Section 5309 Bus obligations to state DOTs are for areas under 50,000 population, when, in fact, funding may be used in urbanized areas.

An alternative option was suggested by FTA whereby funds obligated to a state's grant code at the time of its reservation are distinguished from those reserved for urbanized areas. One could then infer that if the Section 5309 program funds were not reserved to an urbanized area code they were used in a rural area. However, FTA acknowledged

that mistakes can be made in the selection of codes during the fund reservation process.

Ultimately, it was decided that the revenue data contained within the NTD was the most appropriate for use in this analysis. The research team acknowledges not only the lag between the date of reporting versus the date of publication of each year's NTD, but between the date of the apportionment of funds, the date of grant obligation, and ultimately the date of expenditure, which is the information captured by the NTD. In reality, expenditures may follow apportionments (as reported in Chapter 2) by 2 or 3 years. In addition, the quality of the NTD data is dependent on the care with which Section 5311 sub-recipients report data to their state DOTs which then consolidate and submit this information to the FTA. The research team acknowledges the myriad of responsibilities and conflicting priorities faced by both rural transit agencies and their state DOTs on a day-to-day basis that can make NTD reporting a challenge.

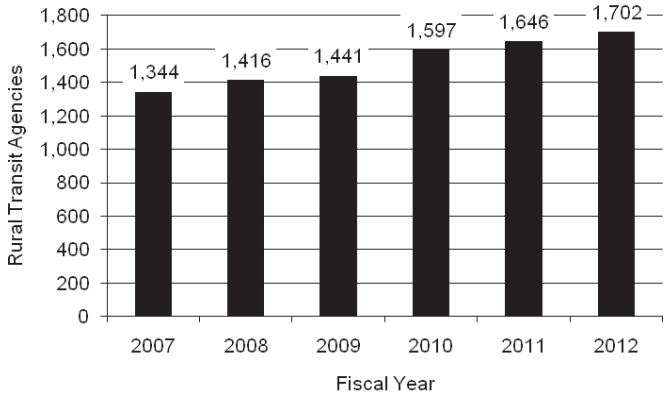
That said, it is the research team's belief that the NTD revenue data demonstrates trends at a level sufficient for the required analyses. This data further reflects the actual use of state, local, and federal funds, not simply their obligation. Funds can go unused for several years following obligation, thus masking their actual impact on infrastructure and service. The NTD data also aligns with the capital asset information (the most important being age) upon which the recapitalization analysis will be performed for Chapter 4 of this digest. In sum, while data reported to the NTD is not perfect, it is FTA's data of record for many uses, including the development of formula program apportionments and reports to Congress on the condition, performance, and safety of the nation's transit systems, and is the best data option for this research.

Rural Public Transportation Profile

Rural public transportation has grown significantly over the last several years, by almost every metric: number of rural transit systems; level of service; ridership; and level of state, local, and federal investment. The following presents NTD rural data that summarizes trends in the growth of public transportation in rural areas.

Rural Transit Agencies

All rural transit agencies that receive Section 5311 Rural Formula funding from their State DOT must report annually (through the DOT) to the NTD. While not the complete universe of rural public transportation providers, NTD reporters represent the vast majority of operators. Since 2007, the number of rural reporters has increased 26.6 percent, as shown in Figure 3-1.

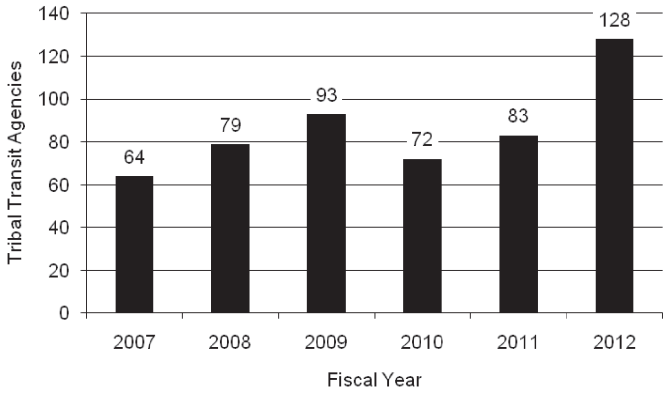


Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure 3-1 Number of rural transit agencies (indirect) reporting to the NTD.

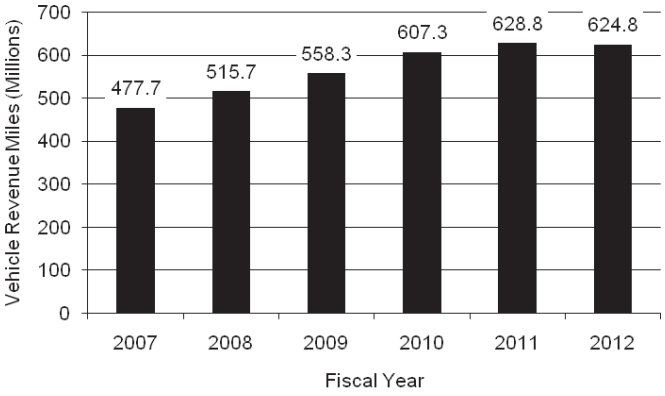
Likewise, the number of transit operators receiving Section 5311(c) Tribal Transit funding has doubled since 2007, as shown in Figure 3-2.

In addition to rural transit operators, transit operators in urban areas are increasingly providing service in rural areas. In 2007, only 55 urban transit operators reported providing service in rural areas. That number had grown to 229 reporters in 2012. These operators are primarily funded under FTA's Section 5307 Urban Formula program; however,



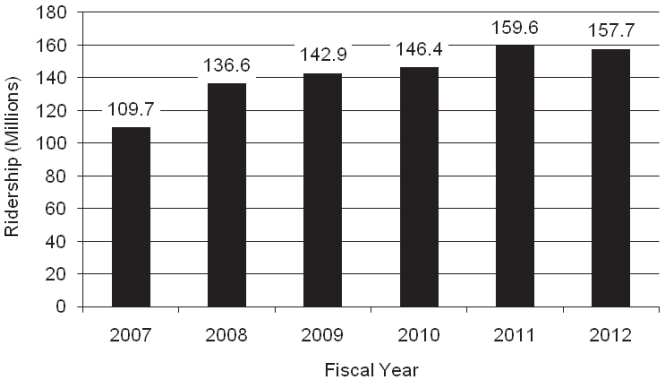
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure 3-2 Number of Tribal Transit agencies reporting to the NTD.



Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure 3-3 Rural transit vehicle revenue miles.



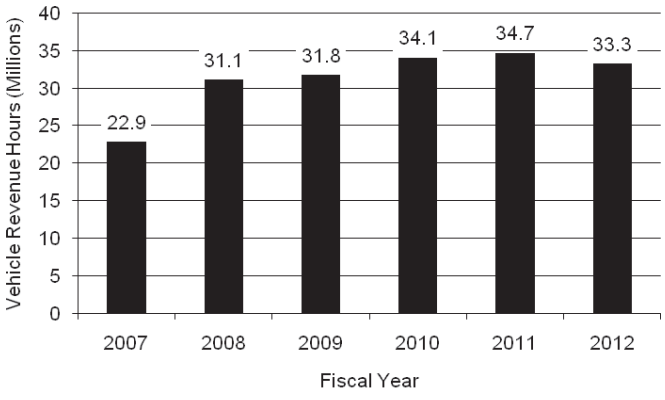
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure 3-5 Annual rural transit ridership.

many also receive Section 5311 funding, most of it for operating assistance.

Rural Transit Service

The increase in providers correlates, until 2011, with greater levels of rural transit service. As shown in Figure 3-3, the number of rural transit vehicle revenue miles (VRM) increased by 31.6 percent from 2007 through 2011. However, the growth between 2010 and 2011 was modest, and declined over one-half percent in 2012. Similarly, Figure 3-4 shows that the number of vehicle revenue hours (VRH) peaked in 2011 after increasing 49 percent in just 5 years, but has declined since then. This stagnation is consistent with the recent economic downturn that resulted in a reduction in state and local revenues for public transportation and other services.



Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure 3-4 Rural transit vehicle revenue hours.

In summary, over the 6-year span of the availability of rural data, VRM increased an average of 5.1 percent per year, while VRH increased 7.6 percent annually.

Rural Transit Ridership

As transit service expanded in rural areas, so, too, did ridership. Figure 3-5 presents the number of annual rural area transit passengers since 2007.

Consistent with the trends in overall rural transit service, rural ridership fell slightly in 2012. But over the 6-year analysis period, the NTD-reported rural transit ridership grew by 43.8 percent, or an average of 7.3 percent per year. This is in contrast to transit ridership nationwide, which grew only 4.1 percent since 2007, or 0.7 percent per year, according to the NTD.

Rural Transit Infrastructure

Table 3-1 presents the active revenue vehicle fleet owned and operated by the nation's rural transit agencies that receive Section 5311 Rural Formula program funding. These vehicles include both those acquired with FTA funding and those purchased with other sources.

The data shows modest growth in the number of vehicles nationwide through 2009, and then a 35.1 percent spike in the size of the nation's rural transit fleet in 2010. This upturn reflects the infusion of nearly $800 million in stimulus funding provided by ARRA for investment in rural transit. Not only did ARRA lead to growth in rural bus and vehicle infrastructure, it also resulted in a decline in the average age of rural vehicle assets, as listed in Table 3-2.

Table 3-1 Total number of rural transit vehicles.

	2007	2008	2009	2010	2011	2012
Aerial Tramway	—	—	—	—	—	—
Automobiles	218	238	274	368	413	359
Bus	2,178	2,482	2,783	3,602	3,605	3,309
Cutaway	4,424	5,361	6,471	9,866	10,907	10,670
Ferryboat	—	—	—	—	5	10
Minivan	1,571	1,916	2,399	3,173	3,496	3,521
Other	152	104	112	4	1	2
School Bus	62	73	57	69	74	69
Sports Utility Vehicle	22	33	75	142	187	208
Van	2,764	3,278	3,525	3,983	4,350	3,993
Total Vehicles	**11,391**	**13,485**	**15,696**	**21,207**	**23,038**	**22,141**

SOURCE: U.S. Department of Transportation, Federal Transit Administration, National Transit Database.

Table 3-2 shows a reduction in the average age of all but school buses, which were the only vehicle type not to experience a growth in fleet size. Notably, in 2007, the average age of 30- to 40-foot buses was just shy of their useful life of 12 years. However, by 2012, according to the NTD the average age of the nation's rural transit bus fleet was only one-half its useful life, and less than the 7.5 year average age of the nation's combined urban and rural fleet.

The vehicle data presented in Table 3-1 for 2012, along with 727 transit facilities reported to the rural NTD, represents the nation's current rural transit infrastructure. The value, condition, and cost to replace this infrastructure are presented in Chapter 4 of this digest.

Rural Public Transportation Funding: Uses and Sources

The provision of public transportation in the nation's rural areas is an expensive endeavor. While this research effort is focused on the funding for maintaining rural transit assets in a state of good repair, the costs to operate transit are greater than the costs to capitalize it. Changes to FTA's capital programs, however, may result in the shifting of federal funds away from operations and toward vehicle and facility replacement, thus potentially reducing the amount available for operating assistance. The following summarizes (a) the cost (capital and operating) to provide rural public transportation service since 2007; (b) how these costs were paid for in terms of state, local, and federal resources; and (c) a more detailed analysis of the use of ARRA, the Section 5309 Bus program, and other FTA funding sources to cover the capital costs of rural transit infrastructure.

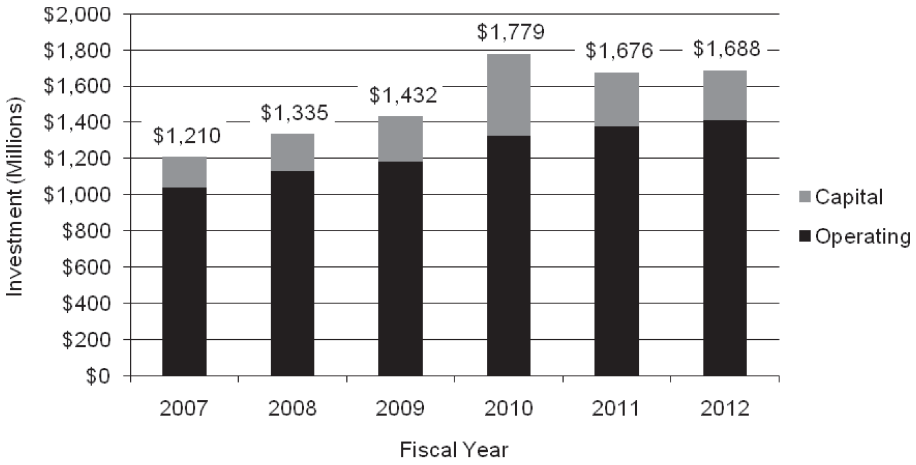
Total Rural Transit Investment

Figure 3-6 presents the total state, local, and federal capital and operating expenditures of

Table 3-2 Average age (in years) of rural transit vehicles.

	2007	2008	2009	2010	2011	2012
Automobiles	14.6	6.8	7.1	6.6	6.6	6.5
Bus	11.1	9.0	6.5	6.3	5.8	6.1
Cutaway	6.7	5.8	5.5	4.9	5.1	5.2
Ferryboat	—	—	—	—	27.0	21.4
Minivan	9.3	6.8	5.0	4.6	4.9	4.9
School Bus	5.5	8.9	10.8	11.8	11.5	12.2
Sports Utility Vehicle	6.3	4.5	4.0	3.6	3.8	4.2
Van	28.3	14.3	6.7	5.5	5.3	5.6

SOURCE: U.S. Department of Transportation, Federal Transit Administration, National Transit Database.



Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure 3-6 Total federal, state, and local rural transit investment.

NTD-reporting rural transit agencies between 2007 and 2012.

Overall state, local, and federal investment in rural transit has increased by 39.5 percent from 2007 to 2012. As Figure 3-6 further shows, capital expenditures have historically been less than funding provided for operations, but has grown in recent years, reflecting the infusion of capital funding made available under ARRA. This funding was required by law to be obligated by state DOTs by 2012 and fully expended by their sub-recipients no later than September 30, 2015. Through 2012, $576 million of the $766 million in ARRA funding for use in rural areas has been expended, leaving a balance of approximately $190 million. The availability of both ARRA and Section 5309 Bus program resources for capital purchases has enabled most states to use more of their FTA funding for operations, as shown later in this chapter.

Sources and Uses of Funds

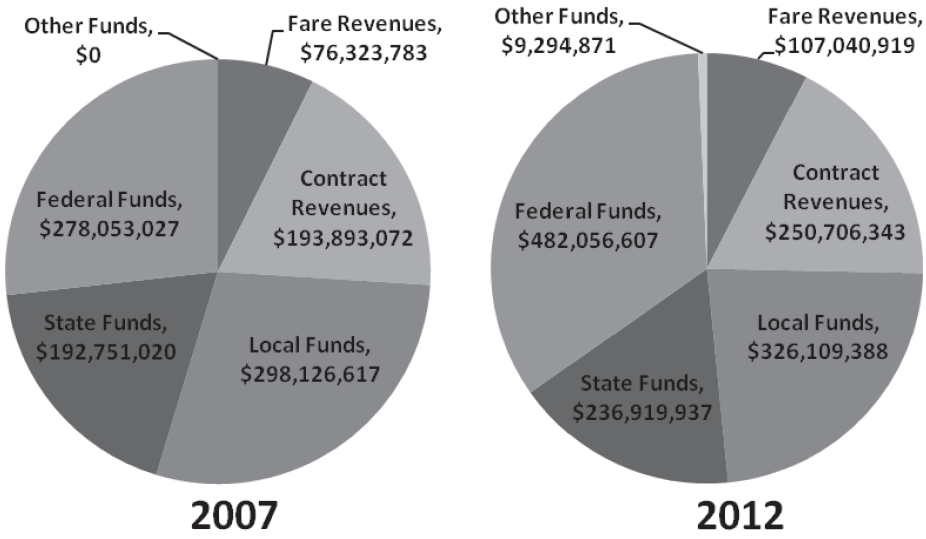
Table 3-3 summarizes operating expenditures reported to the NTD by source over the period of analysis.

Table 3-3 shows an evolution in how rural transit operations are funded. As further illustrated in Figure 3-7, states and localities covered 18.5 and 28.6 percent, respectively, of rural transit operating costs in 2007. By 2012, their share of costs fell to 16.8 and 23.1 percent, respectively. On the other hand, federal funding for operations grew from covering one-quarter of expenses (25.7 percent) in 2007

Table 3-3 Operating expenses by source.

	2007	2008	2009	2010	2011	2012
Fare Revenues	$76,323,783	$86,877,883	$97,452,934	$99,924,169	$99,867,721	$107,040,919
Contract Revenues	$193,893,072	$216,055,871	$198,078,263	$243,679,930	$246,538,882	$250,706,343
Local Funds	$298,126,617	$290,763,558	$296,551,829	$322,085,371	$322,954,327	$326,109,388
State Funds	$192,751,020	$204,559,409	$213,905,597	$235,794,517	$242,526,488	$236,919,937
Federal Funds	$278,053,027	$331,912,318	$375,708,277	$420,160,724	$457,055,477	$482,056,607
Other Funds	$0	$0	$3,132,454	$2,223,100	$5,851,350	$9,294,871
Operating Expenses	**$1,039,147,519**	**$1,130,169,039**	**$1,184,829,354**	**$1,323,867,811**	**$1,374,794,245**	**$1,412,128,065**

SOURCE: U.S. Department of Transportation, Federal Transit Administration, National Transit Database.



Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure 3-7 Share of funding for operating expenditure, 2007 and 2012.

to over one-third (34.7 percent) of total operating costs. Indeed, according to the NTD, federal funding covered 45 percent of the increase in expenditures over the analysis period, as compared with less than 20 percent of state and local funding.

Table 3-4 shows a similar trend for capital investment.

Over the 6-year analysis period, state and local funding accounts for an average $56.6 million annual capital investment in rural transit. As presented in Table 3-4 and Figure 3-8, this state and local investment, as a percentage of total capital investment, has decreased since 2007, while federal investment has increased.

Federal Funding for Rural Transit

Table 3-5 lists the total federal investment, as measured by expenditures reported to the NTD, in rural public transportation between 2007 and 2012.

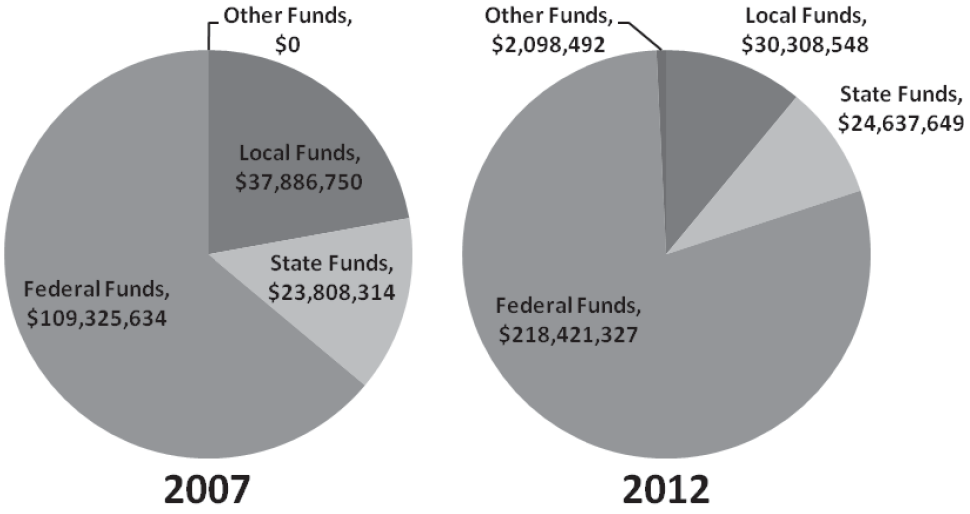
Non-FTA funding represents a very small portion of federal funding for rural transit, and is almost entirely for operating assistance. Although the NTD does not provide specificity to the source of these federal funds, FTA's guidance for reporting revenue and expenditure data to the NTD notes that federal Medicaid payments should be reported as "Other Federal Funds."

ARRA expenditures accounted for 8.2 percent of total FTA investment in rural transit in 2009, 36.9 percent in 2010, 23.0 percent in 2011, and 12.3 percent in 2012. As shown earlier in this chapter, this one-time infusion of federal stimulus funding led to a 35 percent expansion of the nation's rural transit fleet, and a reduction in its average age. In terms of asset age, then, ARRA improved the state of repair of the nation's rural bus infrastructure. Indeed, while the analysis presented in Chapter 4 of this research shows that near term rural transit re-investment needs may be modest, future funding

Table 3-4 Capital expenses by source.

	2007	2008	2009	2010	2011	2012
Local Funds	$37,886,750	$34,167,345	$30,115,042	$19,226,996	$23,341,206	$30,308,548
State Funds	$23,808,314	$28,535,328	$40,565,774	$24,469,812	$22,812,181	$24,637,649
Federal Funds	$109,325,634	$142,548,857	$173,734,124	$410,735,808	$254,898,272	$218,421,327
Other Funds	$0	$0	$2,483,654	$728,220	$651,347	$2,098,492
Capital Expenses	**$171,020,698**	**$205,251,530**	**$246,898,594**	**$455,160,836**	**$301,703,006**	**$275,466,016**

SOURCE: U.S. Department of Transportation, Federal Transit Administration, National Transit Database.



Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure 3-8 Share of funding for capital expenditure, 2007 and 2012.

Table 3-5 Total federal rural transit expenditures.

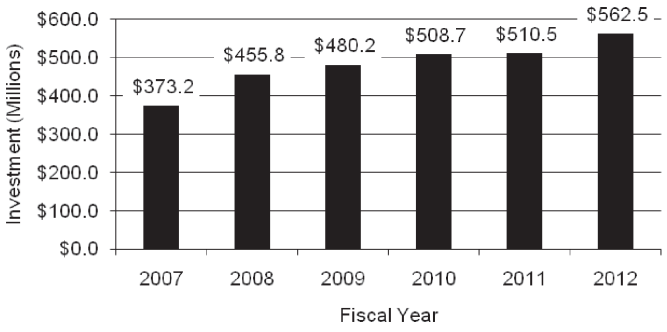
	2007	2008	2009	2010	2011	2012
Total Federal Capital	$109,325,634	$142,548,857	$173,734,124	$410,735,808	$254,898,272	$218,421,327
Total Federal Operating	$278,053,027	$331,912,318	$375,708,277	$420,160,724	$457,055,477	$482,056,607
Total Federal	$387,378,661	$474,461,175	$549,442,401	$830,896,532	$711,953,749	$700,477,934
Total Non-FTA	$14,152,532	$18,695,490	$26,340,872	$20,294,720	$37,571,007	$49,159,272

SOURCE: U.S. Department of Transportation, Federal Transit Administration, National Transit Database.

projections based on recent historical trends in the expenditure of federal funding would overstate the FTA program revenues likely available to maintain not only the rural transit state of repair but also its current level of service. To present a more realistic investment scenario for the subsequent needs analysis, Figure 3-9 presents the total FTA investment in rural transit without ARRA-related expenditures, according to the NTD.

More specifically, Table 3-6 presents total FTA rural capital expenditures by program, without ARRA, while Table 3-7 presents FTA funds expended for operations. Examined together, these tables show their inter-relationship, particularly how rural transit operators purposed Section 5311 program funds in response to the availability of ARRA capital funding.

In addition, according to FTA grant obligation data (separate from the NTD expenditure data) covering FY 2002–2008, roughly 20 percent of Section 5311 program funds were used for capital while 60 percent of program funding was used for operating assistance (the remaining 20 percent of annual obligations were used for a combination of program administration, planning, and RTAP). In FY 2009—the first year of ARRA funding availability—14 percent of Section 5311 funding was obligated for



Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure 3-9 FTA rural transit investment, all programs except ARRA.

Table 3-6 Total FTA capital expenditures (excluding ARRA).

	2007	2008	2009	2010	2011	2012
§5309	$53,674,077	$47,406,850	$49,693,641	$45,840,545	$41,329,378	$57,978,562
§5310	$7,001,936	$9,238,564	$12,845,720	$11,700,156	$8,545,336	$11,155,897
§5311	$45,058,344	$82,566,836	$67,739,598	$56,711,728	$43,819,980	$48,018,232
Tribal Transit	$0	$0	$1,324,049	$879,560	$1,109,449	$1,708,824
JARC	$335,948	$865,236	$1,099,217	$3,161,108	$1,429,399	$3,119,007
New Freedom	$0	$135,043	$1,963,207	$1,233,547	$1,426,077	$1,767,628
Other FTA funds	$113,159	$1,121,186	$288,493	$4,511,265	$2,240,164	$9,114,717
Total FTA Capital	**$106,183,464**	**$141,333,715**	**$134,953,925**	**$124,037,909**	**$99,899,783**	**$132,862,867**

SOURCE: U.S. Department of Transportation, Federal Transit Administration, National Transit Database.

Table 3-7 Total FTA operating expenditures (excluding ARRA).

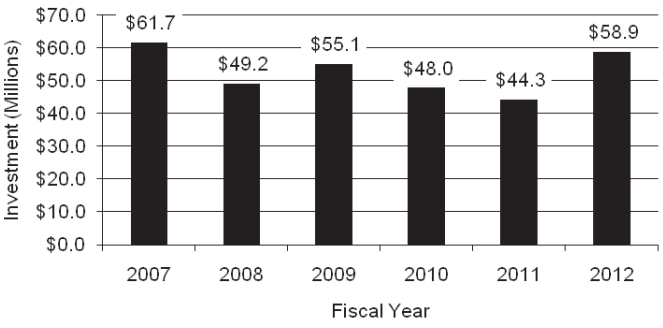
	2007	2008	2009	2010	2011	2012
§5309	$8,052,408	$1,822,070	$5,456,325	$2,119,882	$2,981,839	$910,061
§5310	$11,075,106	$7,396,903	$7,613,131	$10,222,866	$10,351,039	$15,717,600
§5311	$240,068,558	$295,240,609	$308,962,298	$340,887,516	$359,462,404	$369,918,288
Tribal Transit	$0	$0	$6,906,448	$9,120,010	$15,398,620	$19,648,174
JARC	$7,806,445	$9,661,146	$10,063,162	$12,725,633	$14,759,158	$15,025,125
New Freedom	$40,148	$275,402	$1,485,015	$3,594,253	$5,432,756	$7,159,184
Other FTA funds	$0	$35,840	$4,724,573	$5,961,020	$2,262,705	$1,297,868
Total FTA Operating	**$267,042,665**	**$314,431,970**	**$345,210,952**	**$384,631,180**	**$410,648,521**	**$429,676,300**

SOURCE: U.S. Department of Transportation, Federal Transit Administration, National Transit Database.

capital purposes, while 69 percent was obligated for operations. Tables 3-6 and 3-7 show a similar reduction in the use of Section 5311 Rural Area Formula funding for capital—and corresponding increase in funding for operations—beginning in 2009. As ARRA funds near their end of availability for use, and the assets purchased with them near the end of their useful lives and require replacement, it is likely that a growing share of the Section 5311 program will be allocated toward capital, thus reducing the amount available for operations.

This likelihood is further confirmed with the changes that MAP-21 made to the capital Bus program. As noted in Chapter 2, MAP-21 repealed the *discretionary* Section 5309 Bus and Bus Facilities program and replaced it with the Section 5339 Bus and Bus Facilities *formula* program. Moreover, MAP-21 makes available $65.5 million in funding to states—and a maximum of $1.25 million per state—for use anywhere in the state, rural or urban. This level of funding represents a nominal increase over Section 5309 Bus funding expended in rural areas over the period of analysis, according to the NTD data reported by state DOTs, as illustrated in Figure 3-10.

While in the aggregate annual Bus and Bus Facilities program totals rise modestly, a review of state-by-state NTD-reported expenditures demonstrates the varying amounts that states receive in the formularization of the program, as listed in Table 3-8.



Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure 3-10 Section 5309 Bus program expenditures in rural areas.

Table 3-8 Section 5309 Bus expenditures in rural areas, by state, 2007–2012.

State	2007	2008	2009	2010	2011	2012	Annual Average
Alabama	$0	$0	$0	$0	$0	$0	$0
Alaska	$115,340	$325,312	$1,814,029	$228,210	$65	$278,968	$460,321
Arizona	$723,450	$0	$0	$0	$14,586	$28,068	$127,684
Arkansas	$414,028	$1,490,488	$1,680,833	$37,282	$0	$0	$603,772
California	$3,002,186	$677,314	$552,005	$495,837	$513,110	$6,002,352	$1,873,801
Colorado	$8,863,684	$3,351,535	$5,393,902	$1,242,700	$1,265,852	$565,500	$3,447,196
Conn.	$0	$236,047	$3,528	$0	$0	$0	$39,929
Delaware	$0	$0	$0	$0	$0	$0	$0
Florida	$483,061	$61,092	$649,609	$295,832	$244,235	$436,752	$361,764
Georgia	$0	$0	$0	$114,436	$0	$0	$19,073
Guam	$0	$0	$0	$0	$0	$0	$0
Hawaii	$4,828,557	$3,128,301	$2,068,984	$2,604,044	$1,366,238	$1,387,735	$2,563,977
Idaho	$44,228	$411,803	$129,748	$150,513	$0	$222,817	$159,852
Illinois	$0	$839,643	$0	$0	$0	$160,989	$166,772
Indiana	$0	$0	$0	$0	$0	$0	$0
Iowa	$1,981,619	$758,788	$2,705,994	$1,901,862	$1,817,465	$2,347,468	$1,918,866
Kansas	$996,138	$566,862	$620,356	$249,758	$0	$0	$405,519
Kentucky	$0	$0	$5,591,968	$3,860,988	$1,445,838	$2,215,912	$2,185,784
Louisiana	$0	$190,444	$0	$27,998	$0	$518,997	$122,907
Maine	$493,024	$449,034	$160,832	$365,048	$1,081,659	$0	$424,933
Mariana Isle	$0	$0	$0	$0	$0	$0	$0
Maryland	$955,845	$931,196	$977,985	$534,400	$3,308,768	$2,001,470	$1,451,611
Mass.	$0	$124,940	$1,112,785	$247,275	$0	$669,414	$359,069
Michigan	$2,989,648	$5,361,249	$1,367,252	$11,000,323	$4,759,081	$6,574,677	$5,342,038
Minnesota	$0	$0	$0	$0	$0	$0	$0
Mississippi	$0	$0	$0	$0	$0	$0	$0
Missouri	$3,271,452	$5,086,209	$2,311,818	$5,736,519	$4,552,290	$6,284,285	$4,540,429
Montana	$0	$1,692,373	$0	$287,197	$503,620	$273,476	$459,444
N Carolina	$0	$0	$0	$138,984	$90,098	$0	$38,180
N Dakota	$960,754	$554,389	$278,001	$194,449	$830,330	$303,564	$520,248
N Hampshire	$47,239	$901,055	$1,095,444	$1,277,341	$1,197,456	$132,079	$775,102
N Jersey	$0	$0	$0	$610,686	$0	$0	$101,781
N Mexico	$0	$0	$391,861	$331,369	$147,427	$1,052,434	$320,515
Nebraska	$0	$0	$0	$134,283	$0	$278,952	$68,873
Nevada	$0	$0	$0	$0	$0	$245,576	$40,929
New York	$0	$124,000	$0	$0	$26,879	$0	$25,147
Ohio	$0	$0	$0	$0	$0	$0	$0
Oklahoma	$5,574,168	$2,827,558	$2,080,353	$1,104,673	$339,160	$2,962,084	$2,481,333
Oregon	$589,156	$1,067,347	$956,769	$364,678	$1,299,828	$882,446	$860,037
Penn.	$3,039,043	$1,754,333	$3,856,514	$2,195,918	$743,682	$1,989,053	$2,263,091
Puerto Rico	$0	$0	$0	$0	$0	$0	$0
Rhode Isle	$0	$0	$0	$0	$0	$0	$0
S Carolina	$1,842,479	$155,468	$400,440	$327,270	$1,453,209	$275,748	$742,436
S Dakota	$1,069,246	$1,329,861	$1,496,335	$738,872	$4,019,523	$1,666,093	$1,719,988
Tennessee	$2,825,572	$1,789,905	$4,477,190	$2,808,559	$2,381,040	$1,514,593	$2,632,810
Texas	$0	$269,468	$2,171,951	$1,270,722	$609,325	$2,348,621	$1,111,681
Utah	$1,516,404	$0	$0	$1,037,244	$2,579,982	$1,498,174	$1,105,301
Vermont	$3,538,833	$1,937,193	$7,302,920	$2,351,817	$2,741,524	$1,315,440	$3,197,955
Virginia	$438,140	$0	$818,606	$865,741	$2,019	$660,701	$464,201
Washington	$8,234,775	$7,806,845	$914,226	$2,827,599	$3,354,273	$9,564,241	$5,450,327
Wisconsin	$0	$0	$0	$0	$0	$0	$0
W Virginia	$1,869,579	$2,096,454	$901,713	$0	$565,013	$1,664,625	$1,182,897
Wyoming	$1,018,837	$932,414	$866,015	$0	$1,057,642	$565,319	$740,038
Total	**$61,726,485**	**$49,228,920**	**$55,149,966**	**$47,960,427**	**$44,311,217**	**$58,888,623**	**$52,877,606**

SOURCE: U.S. Department of Transportation, Federal Transit Administration, National Transit Database.
NOTE: Shaded states averaged more than $1.25 million per year in expenditures.

Table 3-8 shows average annual Section 5309 Bus expenditures in rural areas over the analysis period of nearly $52.9 million. As highlighted in the table, 14 states averaged more than $1.25 million per year in expenditures. These include large states with significant rural transit service such as California, Pennsylvania, and Michigan. Interestingly, Texas and North Carolina—the two states with the nation's largest rural populations, according to the 2010 Census—expended an average of less than $1.25 million per year. Eleven states did not expend any Section 5309 Bus and Bus Facilities funding during the analysis period.

It must be reiterated that these figures are as reported by state DOTs to the NTD. As noted earlier in this chapter, and as discussed in further detail in Chapter 5, there are limits to the reliability of this data. This data is presented here to compare rural capital funding levels between SAFETEA-LU and MAP-21. Given the transformation of the Bus and Bus Facilities program from a discretionary to a formula resource, as well as difficulties in tracking Section 5309 Bus earmark expenditures at the sub-recipient level, the result is no method for performing such an assessment. However, NTD may provide the best mechanism for achieving a minimal but sufficient understanding of the utilization of Bus and Bus Facilities program funding in rural areas prior to MAP-21. The SAFETEA-LU provision that a minimum of 5.5 percent of the total annual Section 5309 Bus program be used in rural areas—an amount that ranged between $45.2 million (2006) and $54.1 million (2010, 2012) during the period of authorization and its extension—aligns with the expenditure data reported to the NTD.

Furthermore, this expenditure data does not impact or inform the state of good repair needs analysis presented in Chapter 4 of this digest; that is, the assumptions driving the analysis do not rely on historical Section 5309 Bus and Bus Facilities program data.

CHAPTER 4 STATE OF GOOD REPAIR INVESTMENT ANALYSIS

Chapter 3 presented the annual federal investment in rural transit from 2007–2012, as reported in the NTD. The chapter demonstrated that average annual expenditures of SAFETEA-LU *discretionary* Section 5309 Bus and Bus Facilities capital funding in rural areas nationwide is lower than the amount of MAP-21 *formula* Section 5339 funding attributable to states. However, the research also showed that other FTA programs are used to support capital needs in rural areas, especially the Section 5311 Rural Formula program. In fact, over the 2007–2012 period of analysis, nearly $50 million more in Section 5311 program resources was expended for rural transit capital purposes than by Section 5309 Bus and Bus Facilities funding.

Based on the condition and replacement value of the nation's rural transit infrastructure, historical funding data, and assumptions about future funding availability, Chapter 4 presents three specific investment scenarios for evaluating the long-term state of repair of the nation's rural transit infrastructure. The chapter also presents two scenarios that estimate what level of annual funding would be necessary to achieve specific state of good repair outcomes.

TERM-Lite

The analysis presented in this chapter is based on NTD data analyzed with FTA's Transit Economic Requirements Model (TERM)-Lite SGR investment model. TERM-Lite is a PC-based computer application designed to estimate a transit agency's transit capital investment needs over an extended—up to 30-year—time horizon. The model simulates the long-term impact of constrained funding scenarios using a prioritization algorithm, and can estimate the total amount of annual capital expenditures required over a given period to maintain or improve the physical condition and performance of an agency's transit infrastructure. The model considers four prioritization criteria: Asset Condition; Safety and Security; Reliability; and Operating and Maintenance (O&M) Cost Impact. The model also includes unit cost and asset useful life data, as well as the ability to edit these values to meet user-specific criteria.

Transit agencies and other users can import their own capital data into TERM-Lite for analysis. For the purposes of this research, FTA provided the research team with a copy of TERM-Lite loaded with the 2012 NTD rural transit data set. The model (without data) is also available on FTA's website at http://www.fta.dot.gov/13248_13251.html.

Tables 4-1 and 4-2 contain the vehicle useful life and replacement cost assumptions used for the investment analyses presented in this chapter.

The only maintenance facility data reported to the NTD is the number of facilities owned or leased

Table 4-1 Asset useful life assumptions.

	Useful Life (in years)
Automobiles	7
Bus	12
Cutaway	7
Ferryboat	25
Minivan	7
School Bus	7
Sports Utility Vehicle	7
Van	7
Facilities	50

SOURCE: U.S. Department of Transportation, Federal Transit Administration, TERM-Lite.

by—or on behalf of—a Section 5311 sub-recipient. The age of facilities is not reported. Moreover, maintenance facilities vary greatly across systems in terms of size, capacity, equipment, and sub-components. To estimate the cost of replacing rural transit facilities, FTA has developed an algorithm, based on a sample of facility costs for smaller bus operators, which assigns certain parameters to reported facilities according to characteristics of their associated vehicle fleets and size of fleets, as well as their estimated age. These parameters correspond to estimated facility replacement costs. While the assumptions associated with facility replacement costs support an aggregated national analysis of rural transit capital reinvestment needs, the research team decided to exclude facilities from the state-by-state analysis presented later in this chapter.

Finally, TERM-Lite uses the rating definitions presented in Table 4-3 to estimate the condition of rural transit assets.

Table 4-2 Vehicle replacement cost assumptions.

Revenue Vehicles	Replacement Cost
Bus (<30 ft)	$87,451
Bus (30 ft)	$261,894
Bus (35 ft)	$338,665
Bus (40 ft)	$438,559
Motor Bus—Other	$344,800
Over-the-Road Coach	$466,839
School Bus	$46,154
Ferry Boat	$8,045,195
Automobile	$26,481
Heavy-Duty Van	$97,468
Light-Duty Van	$52,000
Medium-Duty Van	$59,000
Minivan	$36,000
Raised Roof Van	$46,842
Super Medium-Duty Van	$94,000
Sports Utility Vehicle	$46,842

SOURCE: U.S. Department of Transportation, Federal Transit Administration, TERM-Lite.

Table 4-3 TERM-Lite condition ratings.

Condition	Description
Excellent	New asset
Good	Asset approaching its mid-life
Adequate	Asset has reached its mid-life
Marginal	Asset reaching or just past its useful life
Poor	Asset well past its useful life

SOURCE: U.S. Department of Transportation, Federal Transit Administration.

Value, Condition, and Cost to Replace the Existing Rural Transit Infrastructure

Table 4-4 presents the active revenue vehicle fleet owned and operated by the nation's rural transit agencies that receive Section 5311 Rural Formula program funding, as well as the average age of each vehicle type. These vehicles include those acquired with FTA funding and those purchased with other sources.

This vehicle data along with 727 transit facilities reported to the 2102 rural NTD, represents the

Table 4-4 Total number of rural transit vehicles and average age (in years) (2012).

	Transit Vehicles	Average Age
Automobiles	359	6.5
Bus	3,309	6.1
Cutaway	10,670	5.2
Ferryboat	10	21.4
Minivan	3,521	4.9
School Bus	69	12.2
Sports Utility Vehicle	208	4.2
Van	3,993	5.6
Other	2	—
Total	**22,141**	—

SOURCE: U.S. Department of Transportation, Federal Transit Administration, National Transit Database.

Table 4-5 Estimated replacement value of the nation's rural transit infrastructure (2014 $).

Infrastructure	Replacement Value
Vehicles	$2,622,305,283
Facilities	$ 958,497,710
Total Rural Transit Assets	**$3,580,802,993**

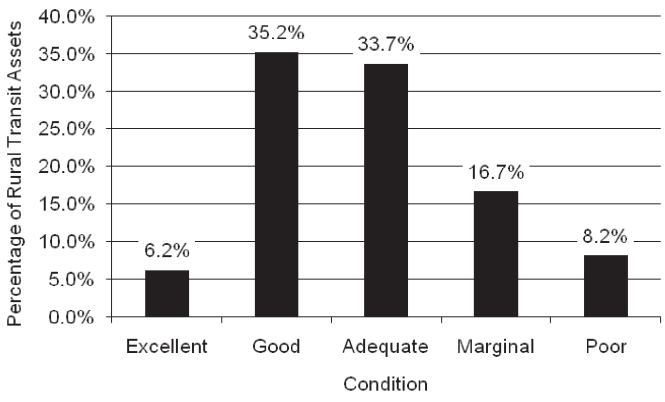
SOURCE: TERM-Lite.

nation's current rural transit infrastructure. Using the asset unit cost data listed in Table 4-2 and TERM-Lite, the replacement value of the nation's rural transit bus infrastructure can be estimated, as listed in Table 4-5.

In addition, by linking asset age to the condition ratings presented in Table 4-3, TERM-Lite can provide a general estimate of the condition of this infrastructure, as shown in Figure 4-1.

In general, the current condition of the nation's rural transit infrastructure is adequate. Over 75 percent of rural transit capital is in an adequate or above condition. As discussed in Chapter 3, this condition is based primarily on the significant investment in new rural transit vehicles and facilities made possible by the ARRA. However, as assets purchased in 2009–2011 begin to reach and exceed their useful life, it would be expected (and, in fact, demonstrated in the following analyses) that the overall condition of this infrastructure will likely deteriorate without sustained reinvestment.

Based on the estimated replacement value of the rural transit capital base and the distribution of its condition, TERM-Lite can estimate an SGR backlog, that is, the one-time cost to bring the infrastructure to a minimum condition of mid-way between "adequate" and "marginal." The level of investment required to attain and maintain a state of good repair is therefore that amount required to replace all assets with estimated condition ratings that are less than this minimum condition value. For the nation's rural transit bus infrastructure, a state of good repair can be achieved with a one-time investment of $699.6 million (in 2014 $).



Source: U.S. Department of Transportation, Federal Transit Administration, TERM-Lite

Figure 4-1 2012 rural transit asset condition distribution.

The asset inventory presented above reflects only that which is reported to the NTD. It is possible that additional vehicles and facilities exist but are not captured in this analysis. Furthermore, this inventory includes only vehicles and facilities reported to the NTD by state DOTs on behalf of rural transit systems operating in their states. As Chapter 3 explained, there are an increasing number of urban operators who receive small amounts of Section 5311 funding to support transit services they provide to rural areas. While these funds are used primarily for operations, there are capital costs associated with the vehicles that provide such services. Consequently, the approximately $3.6 billion replacement value of assets and $700 million single investment to achieve a state of good repair likely *underestimates* the entirety of capital used in the delivery of rural public transportation.

Capital Investment Scenarios for Maintaining and Improving the State of Repair of the Nation's Rural Transit Infrastructure

Based on the condition and replacement value of the nation's rural transit infrastructure, as reported to the NTD, historical funding data, and certain assumptions about future funding availability, the following presents three specific investment scenarios for evaluating the long-term state of repair of the nation's rural transit infrastructure, and two scenarios that estimate what level of annual funding would be necessary to achieve specific SGR outcomes.

Fixed Investment Scenarios

Given historic trends and MAP-21 funding levels, the research team has identified three investment scenarios for analysis:

1. **Maintain current rural transit capital funding levels from capital sources only.** This

reflects an annual capital investment of $122.1 million comprising the following:

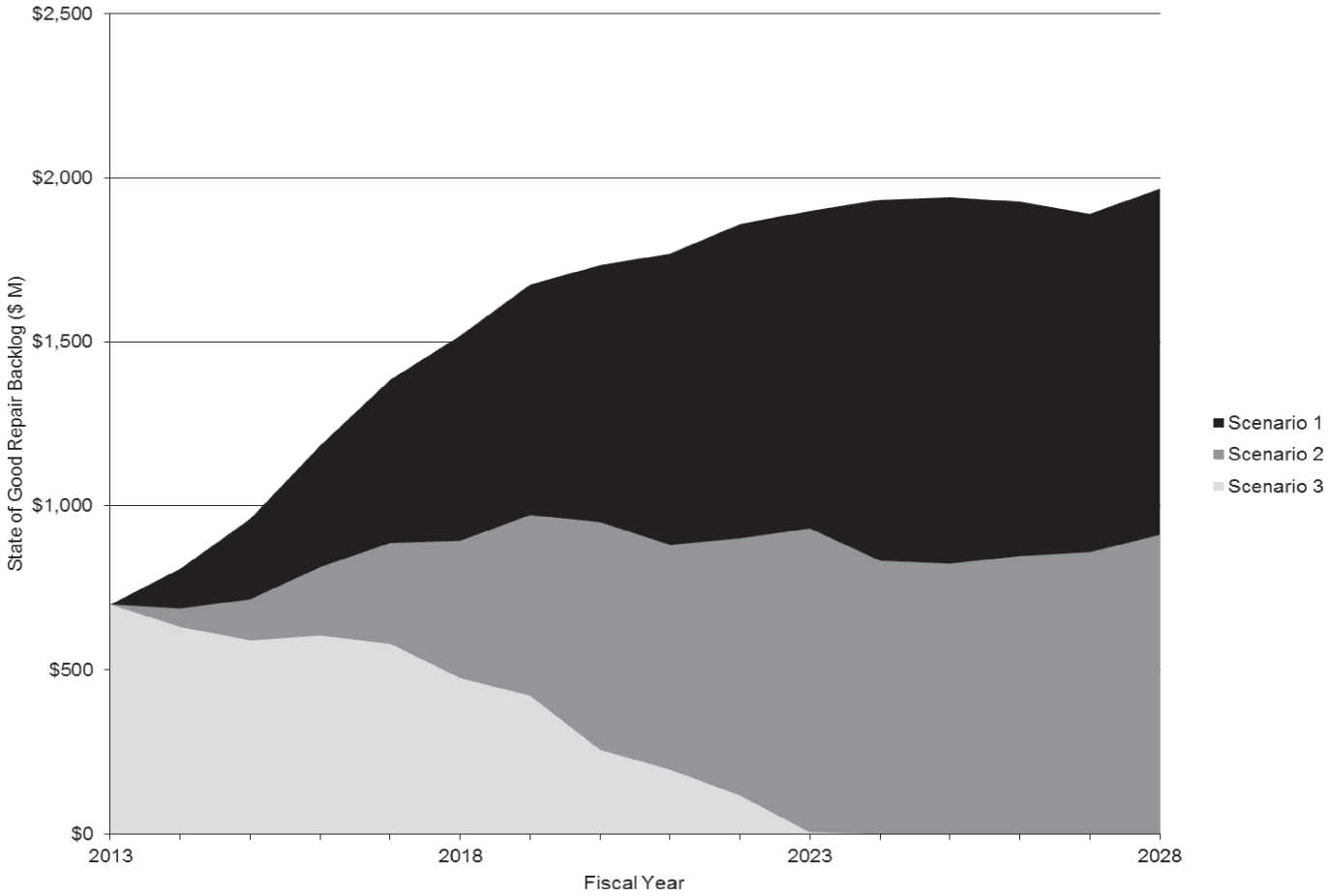
a. $56.6 million state and local funding (the average annual level of state and local investment between 2007 and 2013), plus
b. $65.5 million of Section 5339 program funding attributable to states (this assumes that all of these state-attributable funds are used in rural areas).

Note that the Section 5339 program amounts for states do not escalate over the course of MAP-21, and thus are not assumed to do so here.

2. **Maintain current rural transit capital funding levels from capital sources and section 5311 funding.** This scenario assumes, in the first year of analysis, $244.1 million comprising the following:
   a. the assumptions identified in Scenario 1, plus
   b. $122 million of Section 5311 funding, which is 20 percent (the annual average share of program resources obligated for rural transit prior to ARRA) of the $610 million FY 2013 Section 5311 program.

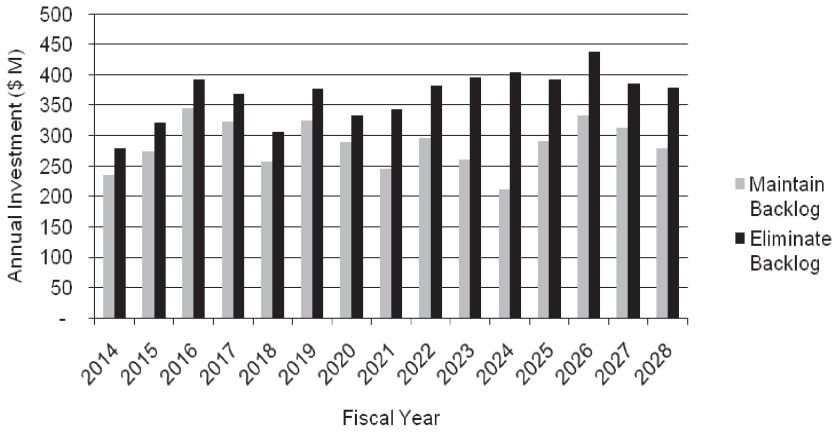
   Section 5311 program funding will be escalated by 1.3 percent annually (the annual rate of growth of the program under MAP-21).
3. **Have an annual capital investment, in the first year of analysis, of $300 million.** Increase this 5 percent annually. This scenario reflects merely a "what if?" scenario to better understand the impact of a significant and sustained level of investment in rural transit infrastructure.

All scenarios assumed a horizon year of 2028. Figure 4-2 presents a graphic demonstrating the impact of these funding scenarios on the value of the SGR backlog.



Source: U.S. Department of Transportation, Federal Transit Administration

Figure 4-2 Fixed investment scenarios impact on SGR backlog.



Source: U.S. Department of Transportation, Federal Transit Administration

Figure 4-3 Annual investment required to meet target SGR backlog.

As Scenario 1 in Figure 4-2 shows, maintaining the current level of capital investment from capital sources—e.g., the MAP-21 Section 5339 Bus and Bus Facilities capital program level matched by historical state and local funding—is forecast to result in a significant underinvestment of rural transit capital needs, almost *tripling* the SGR backlog by 2028. Scenario 2, which adds to Scenario 1 the historical level of Section 5311 Rural Area Formula program funding used for capital purposes and thus most closely represents current capital investment levels (at the expenses of operating assistance) also results in an increase in the SGR backlog through 2028, although in this case the backlog increases by only approximately $215 million. Scenario 3, representing a sustained and growing level of investment in rural infrastructure (at a 5 percent escalation rate the investment level would reach $402 million in 2020 and $594 million by 2028), eliminates the entire SGR backlog within a decade.

Appendix A presents additional results for each fixed investment scenario.

Performance Scenarios

In contrast to determining the impact of fixed funding assumptions on the future condition of the rural transit infrastructure, two additional analyses attempt to estimate the level of annual funding needed to accomplish the following national rural transit objectives:

1. The level of annual investment required to *maintain* the current rural transit SGR backlog of $699.6 million through 2028.
2. The level of annual investment required to *eliminate* the rural transit SGR backlog by 2028.

Figure 4-3 graphically presents the result of these analyses.

Figure 4-3 shows that the amount needed to *maintain* the current SGR backlog over the next 15 years averages $285 million (2014 $) annually. On the other hand, in order to *eliminate* the SGR backlog within that time, an annual average investment of approximately $366 million (2014 $) is estimated. Over the length of the analysis period, the difference between maintaining versus eliminating the backlog is, in total, approximately $1.2 billion (2014 $). Note that the amount of investment required varies per year for both scenarios because it is dependent on recapitalizing the assets in need of replacement during any given year. Note, too, the near-term spike in capital in the period of 2016–2017 reflects the amount of assets purchased with ARRA funding that may have reached their useful life and need replacement.

Additional results for each performance scenario are presented in Appendix A.

State-by-State Breakdown of Rural Transit Vehicle Investment Needs

Table 4-6 provides rural transit vehicle data for each state and territory that reports rural transit data to the NTD. The first column presents the estimated replacement value of each state's rural transit vehicle fleet. As noted earlier in Chapter 4, because of the

Table 4-6 Rural transit vehicle data by state (2014 $M).

State	Replacement Value	Single Investment to Reach SGR	Investment Needed to Maintain SGR		
			2014–2018	2019–2023	2024–2028
Alabama	$48.1	$8.0	$32.3	$35.0	$25.5
Alaska	$32.4	$3.8	$16.8	$16.0	$17.4
Arizona	$19.8	$2.0	$8.7	$15.3	$9.5
Arkansas	$30.2	$10.0	$21.7	$20.8	$20.7
California	$166.7	$25.8	$85.2	$102.6	$104.0
Colorado	$148.1	$37.5	$74.4	$96.7	$93.9
Conn.	$7.1	$0.3	$5.1	$3.4	$5.2
Florida	$58.3	$18.7	$35.8	$42.3	$42.8
Georgia	$35.6	$3.6	$29.4	$20.4	$27.5
Guam	$7.3	$6.8	$0.6	$4.0	$6.6
Hawaii	$47.0	$14.7	$18.4	$34.9	$29.2
Idaho	$19.4	$6.1	$10.2	$14.1	$11.4
Illinois	$72.2	$28.3	$43.1	$45.2	$53.5
Indiana	$45.4	$18.7	$41.8	$33.3	$37.0
Iowa	$114.6	$44.5	$53.7	$85.2	$71.8
Kansas	$21.5	$11.1	$14.1	$18.9	$17.7
Kentucky	$82.9	$26.4	$63.3	$62.4	$63.9
Louisiana	$15.3	$6.3	$11.2	$9.8	$12.5
Maine	$47.1	$18.8	$20.3	$25.6	$27.8
Maryland	$65.4	$29.0	$25.7	$45.5	$45.4
Mass.	$26.8	$5.9	$12.5	$19.8	$13.0
Michigan	$200.6	$21.7	$111.6	$144.3	$108.4
Minnesota	$36.7	$10.0	$23.3	$22.6	$18.7
Mississippi	$44.3	$4.6	$24.6	$33.5	$21.9
Missouri	$66.0	$21.6	$50.5	$56.2	$45.1
Montana	$33.5	$10.4	$13.6	$23.6	$21.9
N Carolina	$76.2	$24.3	$68.3	$61.1	$61.4
N Dakota	$19.4	$7.8	$12.5	$15.8	$13.1
N Hampshire	$17.2	$0.7	$11.9	$10.6	$12.6
N Jersey	$20.9	$4.6	$11.8	$14.1	$11.7
N Mexico	$34.6	$6.1	$18.5	$26.8	$22.6
Nebraska	$11.8	$4.5	$9.9	$7.1	$9.7
Nevada	$15.0	$5.4	$5.7	$10.9	$9.5
New York	$85.8	$12.6	$42.4	$62.3	$47.7
Ohio	$29.7	$12.1	$24.5	$27.4	$26.2
Oklahoma	$80.4	$22.9	$62.0	$56.2	$56.9
Oregon	$50.5	$12.9	$30.1	$34.7	$32.2
Penn.	$101.2	$26.8	$52.2	$69.7	$68.2
Puerto Rico	$1.9	$0.1	$1.7	$1.0	$1.4
S Carolina	$38.8	$9.6	$21.0	$27.6	$19.8
S Dakota	$30.8	$20.9	$15.8	$27.7	$22.0
Tennessee	$80.8	$20.0	$67.4	$60.5	$63.4
Texas	$85.1	$32.0	$59.6	$50.8	$65.0
Utah	$20.3	$2.0	$15.4	$10.4	$13.2
Vermont	$48.8	$2.6	$26.8	$36.9	$27.3
Virginia	$48.7	$5.2	$24.9	$36.3	$26.7
Washington	$129.3	$51.6	$61.5	$88.7	$84.1
Wisconsin	$40.9	$10.1	$29.4	$31.0	$28.4
W Virginia	$32.0	$3.7	$18.9	$19.7	$19.0
Wyoming	$30.1	$6.3	$19.4	$18.9	$18.1
Total	**$2,622.3**	**$699.6**	**$1,559.4**	**$1,838.1**	**$1,712.6**

SOURCE: U.S. Department of Transportation, Federal Transit Administration, TERM-Lite.
NOTE: Neither Delaware nor Rhode Island submits rural transit data to the NTD.

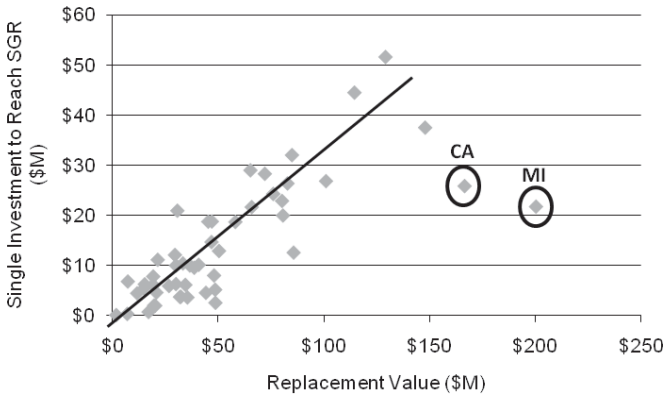
limitations associated with facility data, facilities are excluded from this analysis. The second column presents the total investment needed to reach a state of good repair for this fleet today. The final three columns present the expenditure amounts needed to maintain a state of good repair over the coming 15 years, within investment period increments of 5 years.

As Table 4-6 shows, according to data reported to the NTD five states (Michigan, California, Colorado, Washington, and Iowa) possess approximately 30 percent of the nation's rural transit infrastructure, based on replacement value. This is due in part to the size of these states and their rural populations. As Chapter 2 showed, Michigan, Washington, and Colorado ranked first, second, and fourth in terms of the amount of discretionary Section 5309 Bus and Bus Facility funding states reported to have obligated during SAFETEA-LU. Because of the size of their infrastructure, these states also require the most significant future investment.

Figure 4-4 illustrates the relationship between the replacement value of each state's rural transit infrastructure and the total investment needed to reach SGR.

Note that Michigan and California are outliers. This appears to reflect a lower age of these state's rural transit assets relative to other states. Both states made use of ARRA funding in 2009 to invest in rural transit, and Michigan obligated over $22 million of its Section 5309 earmarks between 2010 and 2012.

Understanding the context of the data sources in Table 4-6 and Figure 4-4 is important. The reliability of the estimated replacement value of rural transit vehicles and the investment to maintain the fleet in a state of good repair is based on (a) the number, type, and age of transit vehicles reported by each state to the NTD and (b) a set of specific replacement cost assumptions. These variables may not align with the actual assets and replacement requirements identified by individual state DOTs. In their review of Table 4-6, two members of the NCHRP Project 20-65/Task 55 panel noted that the replacement value of vehicles reported for their states did not align with their own records. For state DOTs that keep more detailed information on their rural transit assets than the NTD, and that assume different replacement costs than the default costs embedded within TERM-Lite, results should be expected to vary.



Source: U.S. Department of Transportation, Federal Transit Administration

Figure 4-4 Relationship between replacement value and investment to reach SGR.

The strengths and weaknesses of this research's methodology, and its applicability to a broader analysis of transit investment needs, are presented in Chapter 5.

CHATER 5 ASSESSMENT OF THE RESEARCH METHODOLOGY

The objective of this digest is to estimate the long-term impacts of MAP-21 on the nation's local rural transit bus infrastructure. To accomplish this objective, the research team undertook the following:

- Compared historical (since 2006) transit funding levels provided by federal, state, and local sources with those available under MAP-21;
- Compared the amount of SAFETEA-LU *discretionary* Section 5309 Bus and Bus Facilities expenditures in rural areas, as reported to the NTD, with the amount of MAP-21 *formula* Section 5339 Bus and Bus Facilities funding made available to states for use in rural areas;
- Identified future funding assumptions for rural transit capital investment based on these historical comparisons;
- Analyzed the current state of repair of the nation's rural transit capital assets; and
- Based on its *current* state of repair, estimated the impact of various funding assumptions on the *future* state of repair of the nation's rural transit infrastructure, including estimating the level of annual funding needed to (a) maintain the current state of repair and (b) eliminate the SGR backlog.

This chapter assesses the strengths and weaknesses of this research approach, focusing on the data and analytical tools used to perform it. In addition, this chapter provides a general estimate of the level of effort needed to extend the research beyond an analysis of simply rural transit needs.

Research Data

The research required two primary types of information on rural public transportation: (1) financial data, particularly historical levels of investment, by funding source; and (2) capital asset data. The following summarizes the strengths and weaknesses of the information used to support this research.

Financial Data

FTA possesses very good aggregate information on historical annual federal program authorizations, appropriations, apportionments, and obligations. Most of this information is available online. FTA has archived its annual apportionments notices since FY 1996 (http://www.fta.dot.gov/grants/15032.html), and has produced and posted online annual "statistical summaries," which include grant obligation data, for the years FY 1999 through FY 2012 (http://www.fta.dot.gov/grants/13473.html). Both data sets were used in this research.

Both data sets include formula grant program information for the specific population categories to which programs are apportioned. For example, Section 5307 Urbanized Area Formula funds are distinguished by FTA for three population categories defined within federal transit law: greater than 1,000,000; between 200,000 and 1,000,000, and between 50,000 and 200,000. Funding is further identified for each urban area within these categories. Prior to MAP-21, Section 5316 JARC funding was reported according to the three population categories defined by SAFETEA-LU: greater than 200,000 ("large urban"); between 50,000 and 200,000 ("small urban"); and under 50,000 ("non-urban" or "rural"). The rural component of all formula grant programs is administered by state DOTs; information on specific locations within rural areas where these funds are being used is not captured by FTA in its grants data.

Geographic data on the use of discretionary funding is more limited. FTA does not have detailed or reliable data on how and where Section 5309 Bus and Bus Facilities earmarks obligated to states were used. As noted in Chapter 3, before MAP-21 many rural areas received Section 5309 funding under a statewide earmark obligated to their state DOT; however, it is not possible to distinguish how much of such a grant went to urbanized versus rural areas.

An alternative to FTA-generated Section 5309 program data would be to collect it from each state DOT. However, the level of effort associated with collecting and consolidating this information nationally was outside the scope of this research. The NTD does, however, require that Section 5311 subrecipients report annually, through their state DOTs, revenues expended by source and purpose (capital and operating). Specific federal sources to be reported include the Section 5309 program. As noted in Chapter 3, the research team determined that the NTD data was the most appropriate for use in this analysis. The NTD is FTA's data of record for many uses, including the development of formula program apportionments and reports to Congress on the condition, performance, and safety of the nation's transit systems. The NTD data also aligns with the capital asset information (most importantly age) upon which the recapitalization analysis was performed for Chapter 4 of this digest. Finally, NTD data is readily available online (http://www.ntdprogram.gov/).

However, NTD revenue data is not perfect. The research team acknowledges not only the lag between the date of reporting versus the date of publication of each year's NTD, but also between the date of the apportionment of funds, the date of grant obligation, and ultimately the date of expenditure, which is the information captured by the NTD. In fact, expenditures may follow apportionments by 2 or 3 years. More concerning is the *accuracy* of NTD-reported data, particularly for rural transit. Faced with meeting the day-to-day challenges of providing transit service, rural transit operators are often stretched thin to effectively meet the myriad of administrative requirements associated with receiving federal funds, including NTD reporting. Similarly, a state DOT may not have the time, staff, or resources to sufficiently validate the NTD rural data that it submits to FTA on behalf of its Section 5311 program sub-recipients. As an example of one inaccuracy, according to the 2009 NTD nearly $5.5 million in Section 5309 funding was expended for operating assistance that year. However, it must be noted that operating costs are *not* an eligible Section 5309 program activity.

Capital Asset Data

The NTD was also the source of the capital asset data used for this research. The benefits of using this data are its credibility as the FTA source of record for meeting a number of statutory requirements, its standardization (at least for vehicles), and its availability. In fact, the research scope does not include using any other data source for the SGR analysis. In interviews with representatives from several state DOTs, the research team learned that some had no better data on rural capital assets within their own states than that provided through the NTD. In other words, even if the research effort included the collection of rural transit capital asset data from each individual state, some would only be able to report NTD data. Where more detailed information was available, ensuring consistency among states would have been work-intensive undertaking.

But, as with the revenue data described above, the NTD data is only as accurate as how it is and what is reported. Age—derived from the year of manufacture—is the only measure of the condition of vehicles; furthermore, as described in Chapter 4, the NTD does not collect the age of facilities. As previously noted, this limits the reliability of the disaggregation of rural data at the state level to only vehicles.

Analytical Tools

As described in Chapter 4, FTA's TERM-Lite model was used to identify the replacement value of the nation's rural transit infrastructure, the amount of its SGR backlog, and the impact of various investment scenarios on the long-term condition of the fleet. TERM-Lite is a relatively simple tool. In fact, according to FTA training materials (http://www.fta.dot.gov/documents/TERM_Lite_Overview.pdf):

> *"TERM-Lite is an MS-Access based tool designed for use by a novice. The analyst controls the simulation by using the following modules:*
>
> - ***Inventory Publisher:*** *Transferring inventory data from MS Excel to TERM*
> - ***Prioritization Settings:*** *Assign priority weights to each of five criteria (asset condition, safety and security, reliability, O&M cost impact, and user-defined criterion) and score each asset type on those five criteria*
> - ***Expenditure Constraints:*** *Specify the maximum annual funding available to the simulator*
> - ***Backlog Target Seek:*** *Optimize funding to achieve a specific reduction in backlog*
> - ***Inventory Management:*** *Add, delete, or modify the inventory details*
> - ***Expansion Analysis:*** *Review the impact of adding new capacity on annual expenditure needs and long-term backlog growth/decline*
> - ***Life Cycle Cost:*** *Edit assumptions regarding number and cost of interval rehabilitations, unit replacement cost, and useful life by asset type*
> - ***Inflation Module:*** *Specify how costs should be escalated over time and how results are displayed"*

For this research, the only "simulation control" applied was the level of annual capital investment. Only model default values for replacement costs and asset useful life were used.

Replicability and Applicability of Research

Assuming the use of the NTD and TERM-Lite as the foundation for additional analyses of the capital reinvestment needs of a broader set of transit infrastructure, the present research methodology is easily replicable. In fact, NTD data reported by urban transit operators is much more robust than that reported by state DOTs for rural systems, and the use of such should be expected to yield even more reliable forecast results.

Moreover, the application of this research methodology may yield even better information in the near future. As rural transit operators and state DOTs gain more experience with NTD reporting (recall that rural NTD reporting is less than 10 years old), the accuracy of the reported data should be expected to improve. Technology improvements may further assist with reporting. In an effort to facilitate the collection of data necessary to meet MAP-21 (and subsequent surface transportation authorization) SGR and safety requirements, it is possible that the NTD would become a more robust source of data, yielding more comprehensive research results.

Likewise, future updates and improvements to TERM-Lite may facilitate enhanced research. While relatively easy to use, the research team notes the level of documentation associated with TERM-Lite may be a detriment to deeper analyses. While default model assumptions can be used to answer the questions

addressed in this research, it may be difficult to "unleash" the full functionality of TERM-Lite without more advanced access database skills and "trial and error" model runs.

CHAPTER 6 CONCLUSIONS

This digest describes how MAP-21 impacts the condition of the nation's rural transit infrastructure. This was accomplished through a review of the legislation, most importantly its new requirements and modifications to previously authorized transit programs; a historical analysis of funding for rural transit, spanning both SAFETEA-LU and MAP-21; and an analysis of the impact of various future funding levels as reported to the NDT. Among the key findings of the digest are the following:

- MAP-21 is a transformative Act. Its emphasis on transit capital asset management and safety—and new requirements for transit agencies, urban and rural, to develop associated plans for ensuring that their systems are both safe and maintained in a state of good repair—is helping to inform local transit investment priorities. However, MAP-21 provides no new funding for the establishment of transit asset management or safety plans, and only modest growth in the overall federal transit program.
- As described in the research, it is difficult to compare the level of rural transit capital investment between SAFETEA-LU and MAP-21. Changes in program formulas and set-asides, the consolidation of programs, the one-time impact of funding under the ARRA, and limitations in FTA's tracking of Section 5309 earmarked funds in rural areas allows for an understanding of trends, but "apples-to-apples" comparisons may be difficult.
- Including the consolidation of JARC into the Section 5311 Rural Area Formula program, formula resources for rural transit under MAP-21 have grown by approximately 11 percent over SAFETEA-LU funding levels. Annual Section 5311 program growth under MAP-21, however, is only 1.3 percent.
- Although not a rural program, MAP-21's consolidation of SAFETEA-LU's Section 5317 New Freedom program into the Section 5310 Enhanced Mobility program and revised fund allocation formula—which distributes funding directly to urbanized areas—reduces state DOTs discretion to put resources where they are needed most. According to many of the state DOT officials interviewed for this research, the MAP-21 distribution scheme negatively impacts rural transit providers, because a large portion of Section 5310 funds are typically used in rural areas.
- The replacement of the *discretionary* Section 5309 Bus and Bus Facilities capital program with the *formula* Section 5339 Bus and Bus Facilities program appears to result in a net benefit to rural transit operators. According to the NTD, an average of $52.9 million in Section 5309 funding was expended annually in rural areas between 2007 and 2012. MAP-21 provides $65.5 million in Section 5339 funding annually to state DOTs through FY 2014, although these funds are not limited to use in rural areas.
- According to NTD data, the formularization of the Bus and Bus Facilities capital program affects states differently. Assuming that state DOTs use the entirety of their Section 5339 program resources in rural areas, 39 states and territories will receive more Bus and Bus Facilities program funding under MAP-21, while 14 states will receive less.
- Federal funding as a share of both capital and operating funding for rural transit has increased since 2007.
- The influx of ARRA funds in 2010 resulted in an increase in the use of Section 5311 funding for operating assistance. As ARRA funds near their end of availability for use, and the assets that were purchased with them near the end of their useful lives and require replacement, it is likely that a growing share of the Section 5311 program will be allocated toward capital, thus reducing the amount available for operations.
- Capital investment needs are expected to grow in the coming years. According to NTD data, the replacement value of the nation's rural transit infrastructure is estimated at nearly $3.6 billion. A state of good repair for this infrastructure is estimated at approximately $700 million.
- These estimated investments only reflect rural assets reported to the NTD. It is possible that additional vehicles and facilities exist but are

not captured by the NTD. Furthermore, these estimates reflect only those vehicles and facilities reported to the NTD by state DOTs on behalf of rural transit systems operating in their states. Some urban transit operators receive Section 5311 funding to support transit services they provide to rural areas. While these funds are used primarily for operations, there are capital costs associated with the vehicles providing such services. Consequently, this research possibly underestimates the entirety of capital used in the delivery of rural public transportation.

- A $122.1 million annual capital investment in rural transit—the equivalent of the average annual state and local capital investment in rural transit since 2007 plus the annual Section 5339 program attributable to state DOTs—may result in an SGR investment backlog of nearly $2 billion by 2028—nearly triple the current backlog.
- An average annual investment of approximately $285 million is estimated to maintain the "status quo" of the condition of the nation's rural transit infrastructure.
- An average annual investment of approximately $366 million is estimated to eliminate the SGR backlog by 2028.
- Assuming the use of NTD data and TERM-Lite as the foundation for additional analyses of the capital reinvestment needs of a broader set of transit infrastructure, the present research methodology is easily replicable. However, any future research should note the limitations of the NTD.

In summary, projecting historical funding levels into the future—even accounting for modest escalation—is insufficient to meet the long-term needs of the nation's rural transit infrastructure. The growth in rural transit ridership further suggests an increasing need for capital expansion, while the costs to operate rural transit can be expected to grow. One question to consider is how the next surface transportation authorization can be designed and resourced to provide both capital and operating funding to sustain and improve the current condition and level of service of rural transit systems.

The President's Grow America Act proposes a 360 percent increase in the Bus and Bus Facilities program, and reinstates 30 percent of it—over $2.3 billion over 4 years—as a discretionary allocation. The Act does not appear to modify the level of funding set aside for use by state DOTs in rural areas, and the program remains an overwhelmingly urban program. In addition, the Section 5311 Rural Formula program grows by 10 percent.

In the meantime, federal policy focuses on better management of transit capital as a way to optimize its condition and performance. But the schedule for implementing MAP-21's state of good repair is likely uncertain. MAP-21's asset management requirements are helping to promote a greater awareness of the need to systematically manage transit capital and make informed investment decisions. However, there is an absence of corresponding funding to implement asset management plans and to ensure transit state of good repair commitments.

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Sean Libberton, Principal Consultant at Parsons Brinckerhoff, was the Project Director and Principal Investigator of the research. His research team included Crystal Cummings, Ihsaan Patel, and Amanda Wall Vandegrift, as well as Lisa Koch of Parsons Brinckerhoff's Kansas City office.

Sean and his team are grateful to a number of individuals who provided information, data, and advice on the research effort. From the FTA, Jamie Pfister, David Schneider, and Lorna Wilson provided key insights into the MAP-21, as well as historical program apportionment data, which informed the research. Also from the FTA, Keith Gates prepared and provided the research team with a series of NTD datasets for rural transit. This data supported the historical analysis of rural transit performance and investment trends. Keith also provided the research team with the TERM-Lite tool—and training on how to use it—that supported the capital investment needs analysis. Finally, Keith provided the team with access to his able NTD and TERM consultants, including Todd Schrecongost, Andy Lofton, Joe Eldridge, Daniel Schriever, and Rick Laver.

Sean and Lisa interviewed a number of state DOT officials to gain their observations of MAP-21 changes and rural transit issues in their states. Interviewees included Mike Schaduaer and Tom Gottfried (Minnesota DOT); Dave Seech, Skip Dunkle, and Marianne Freed (Ohio DOT); John Dockendorf, John Levistky, and Robert Sharp (Pennsylvania DOT); Kim Johnson and Andrea Brush (Michigan DOT);

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Finally, the research team would like to express thanks to the NCHRP Project 20-65/Task 55 program manager and the entire panel for their comment and direction on this research.

APPENDIX A: INVESTMENT SCENARIO ADDITIONAL ANALYSES

This appendix provides greater detail on the three fixed investment and two performance scenarios presented in Chapter 4. Information and the figures provided for each investment scenario include the following:

- SGR backlog by vehicles and facilities
- SGR backlog by type of vehicle
- Percent of replaceable rural transit capital assets that exceed their useful life
- Percent of assets in marginal or poor condition, as defined in Chapter 4

Fixed Investment—Scenario 1

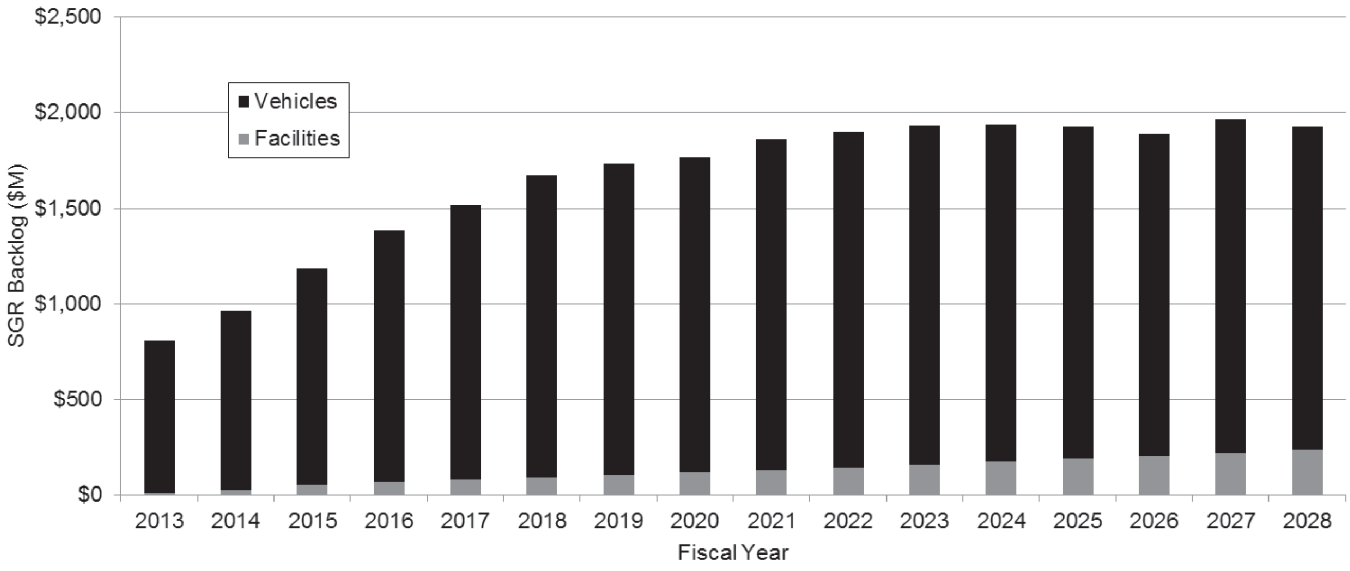
Figures A-1 through A-4 illustrate that an annual capital investment of $122.1 million—e.g., the MAP-21 Section 5339 Bus and Bus Facilities capital program level matched by historical state and local funding—is inadequate and results in a substantial increase of the SGR backlog over the next 15 years. Note that within 10 years the percent of assets that exceed their useful life increases from less than 30 percent to greater than 60 percent, while the percent of assets in poor condition rises steadily from less than 10 percent to greater than 30 percent. The SGR backlog appears to reach a state of equilibrium at this time where the backlog is maintained at three times the current level.

Fixed Investment—Scenario 2

Scenario 2 adds a portion of the Section 5311 Rural Area Formula program funding from operations to capital to the Scenario 1 funding assumption. However, this still results in an increase of approximately $215 million from the current SGR backlog by 2028. This increase is almost entirely due to a rise in the facilities' re-investment backlog. On a positive note, the percent of assets that exceed their useful life decreases over the analysis period, while assets in poor condition are eliminated entirely. See Figures A-5 through A-8.

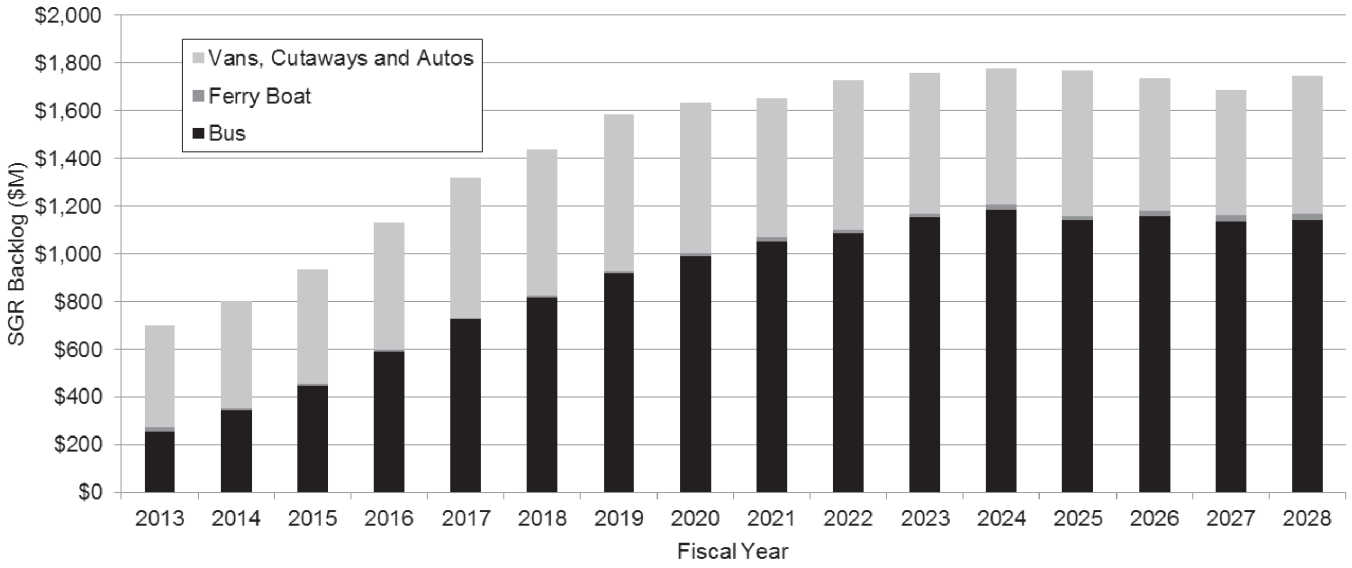
Fixed Investment—Scenario 3

As Figure A-9 shows, Scenario 3, which represents a significant, sustained, and growing level of investment in rural infrastructure, eliminates the vehicle SGR backlog by 2021 and the facilities SGR backlog



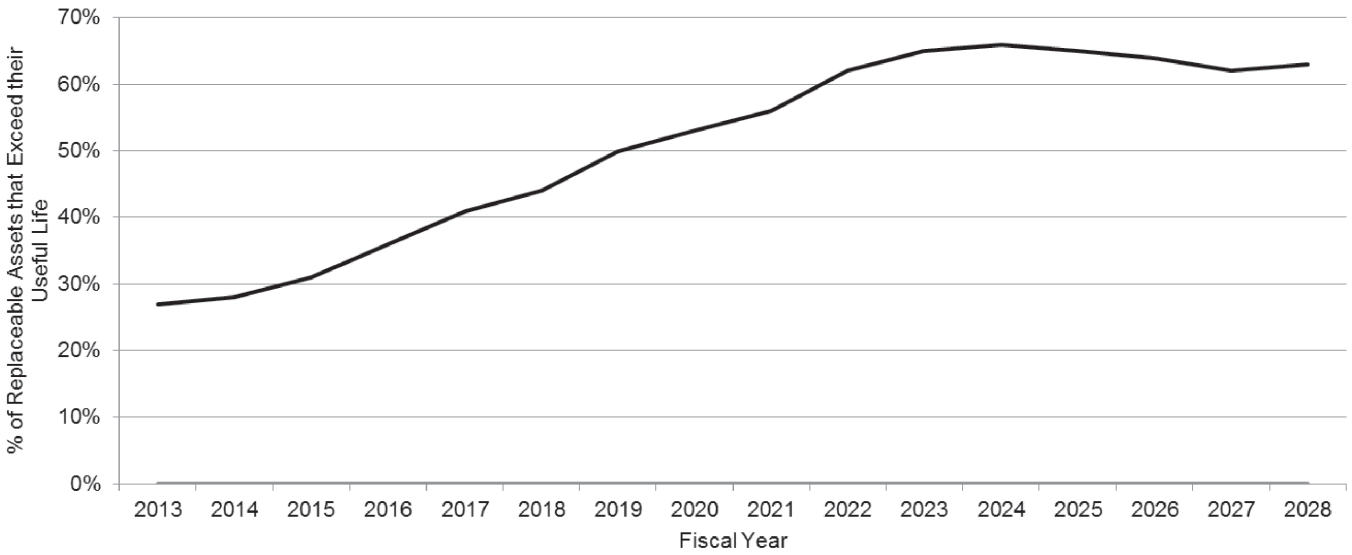
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-1 SGR backlog by vehicles and facilities: Fixed Investment—Scenario 1.



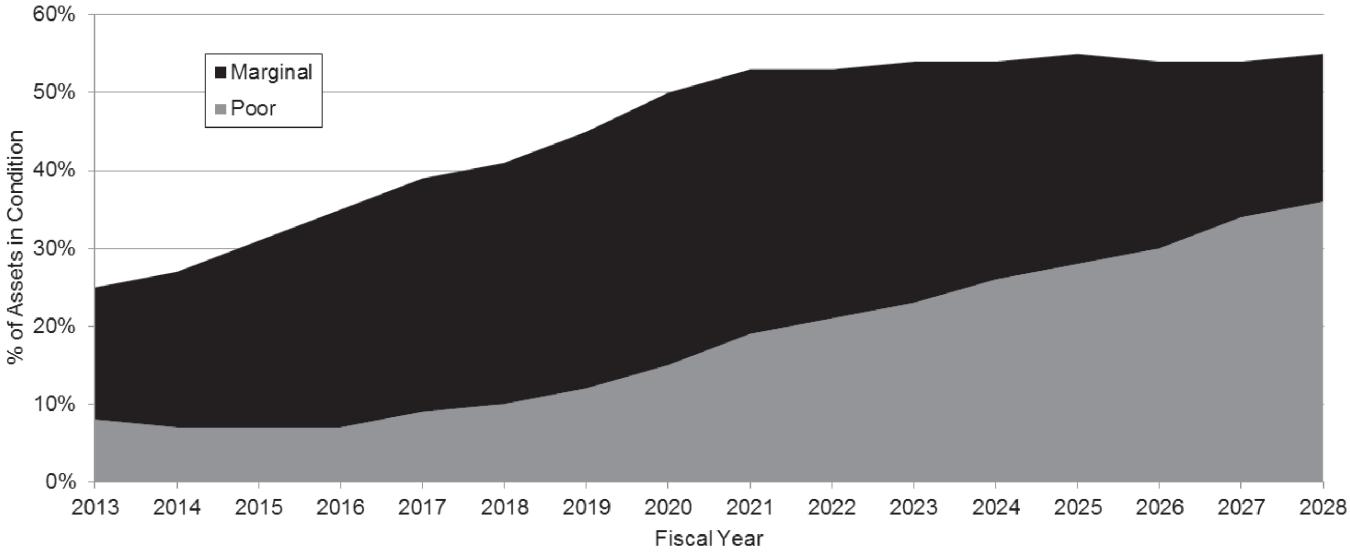
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-2 SGR backlog by type of vehicle: Fixed Investment—Scenario 1.



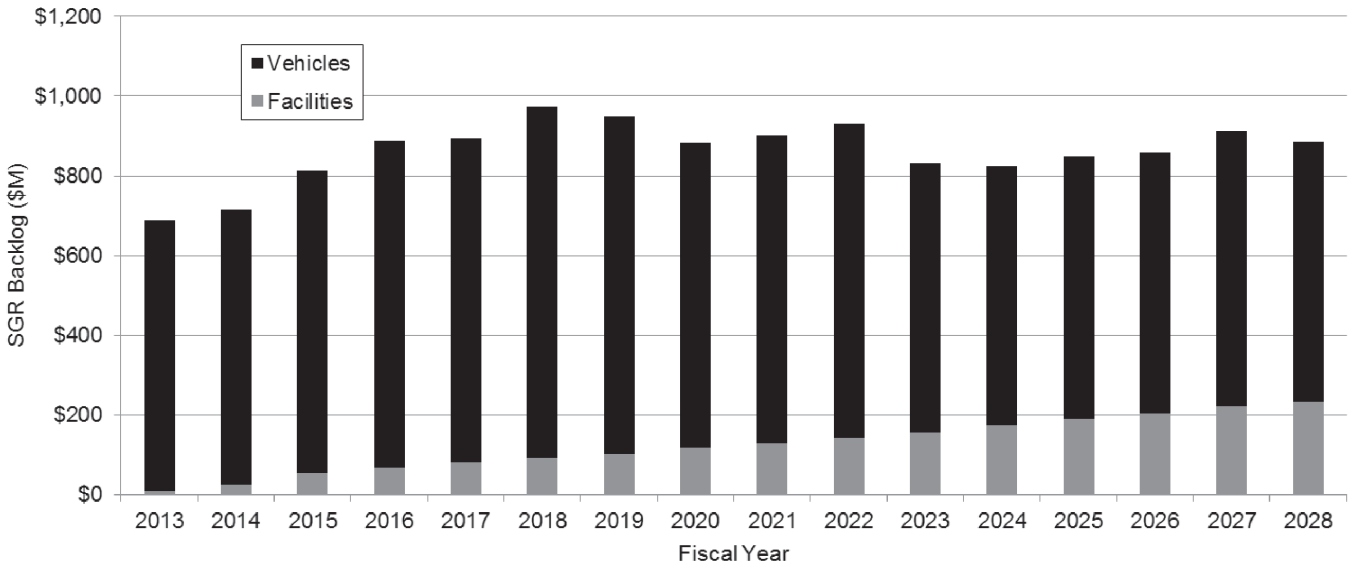
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-3 Percent of replaceable rural transit capital assets that exceed their useful life: Fixed Investment—Scenario 1.



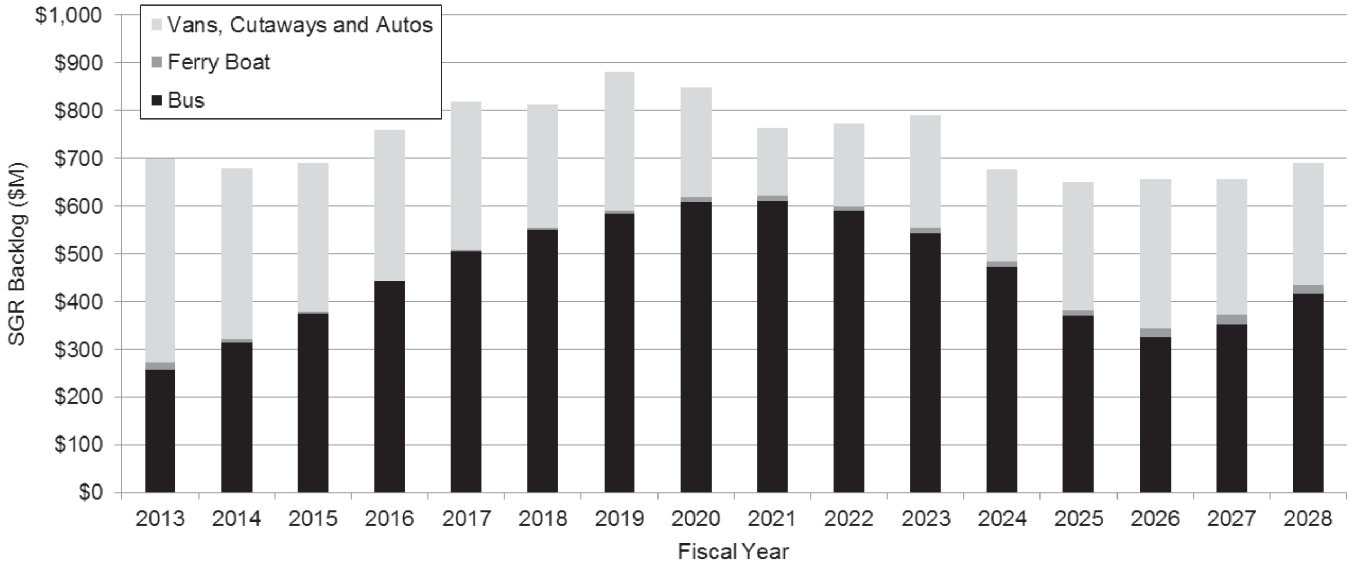
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-4 Percentage of assets in marginal or poor condition: Fixed Investment—Scenario 1.



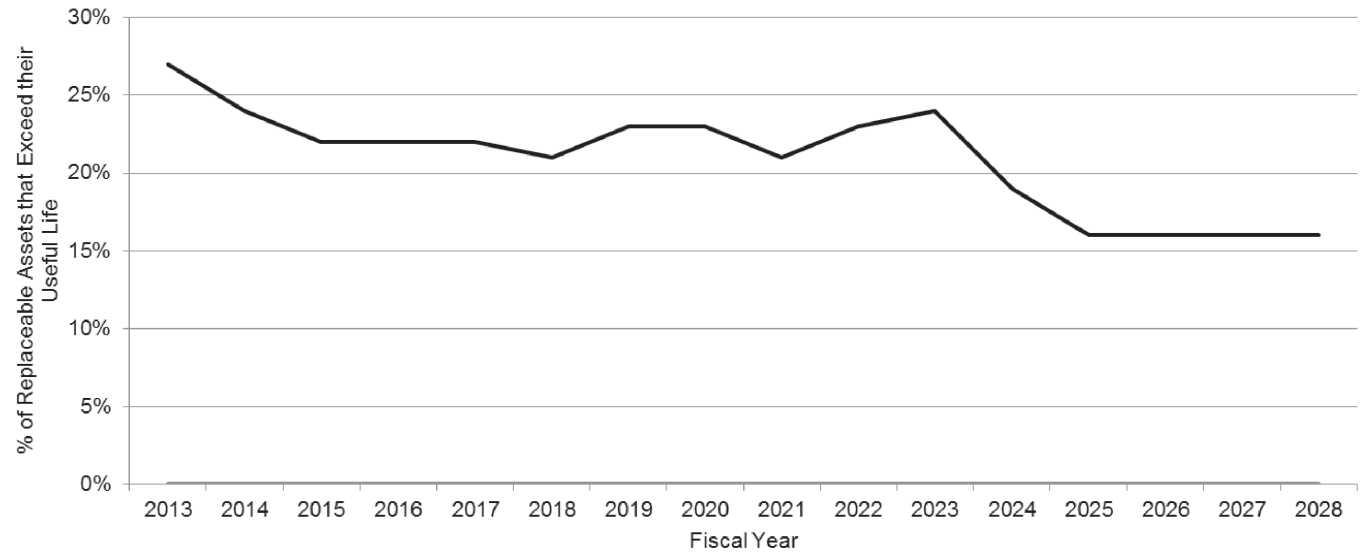
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-5 SGR backlog by vehicles and facilities: Fixed Investment—Scenario 2.



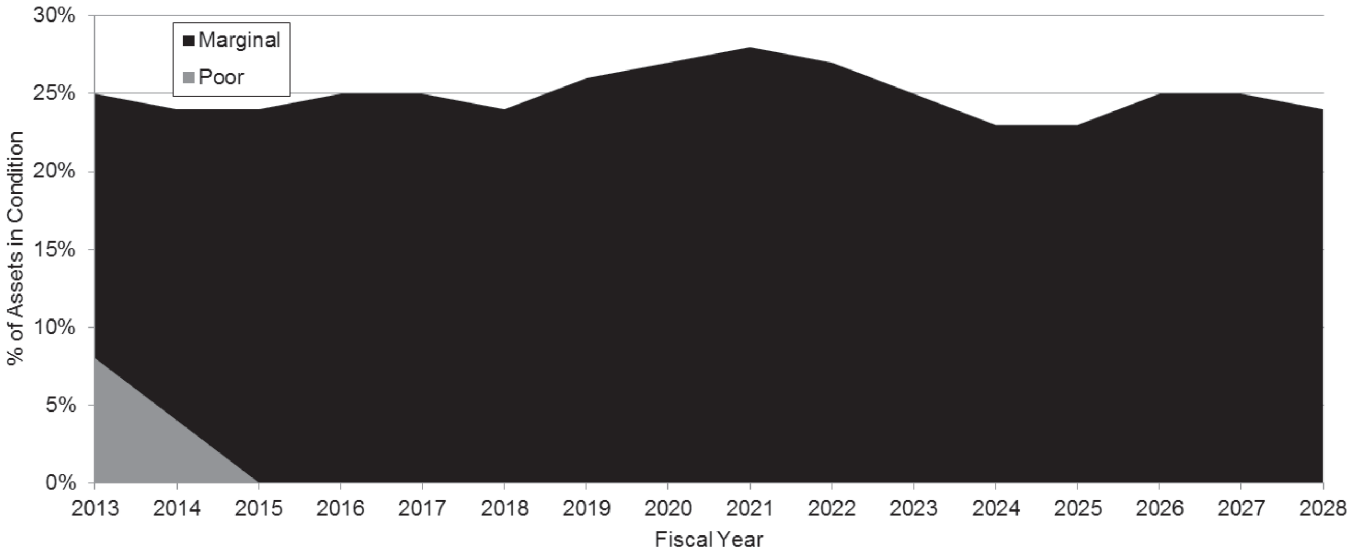
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-6 SGR backlog by type of vehicle: Fixed Investment—Scenario 2.



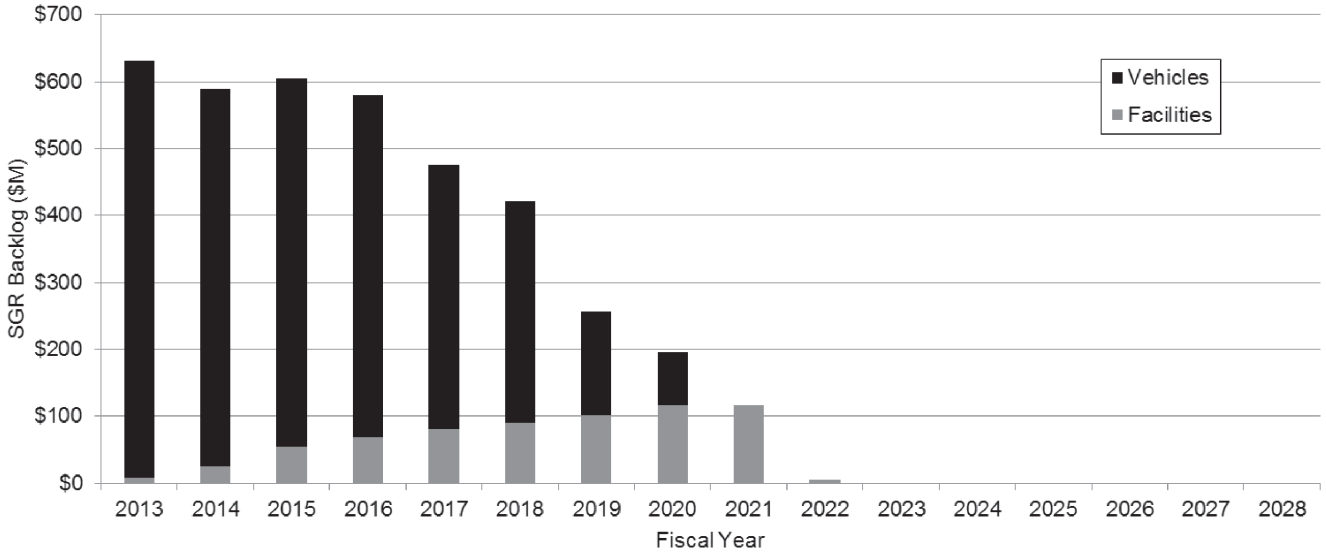
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-7 Percent of replaceable rural transit capital assets that exceed their useful life: Fixed Investment—Scenario 2.



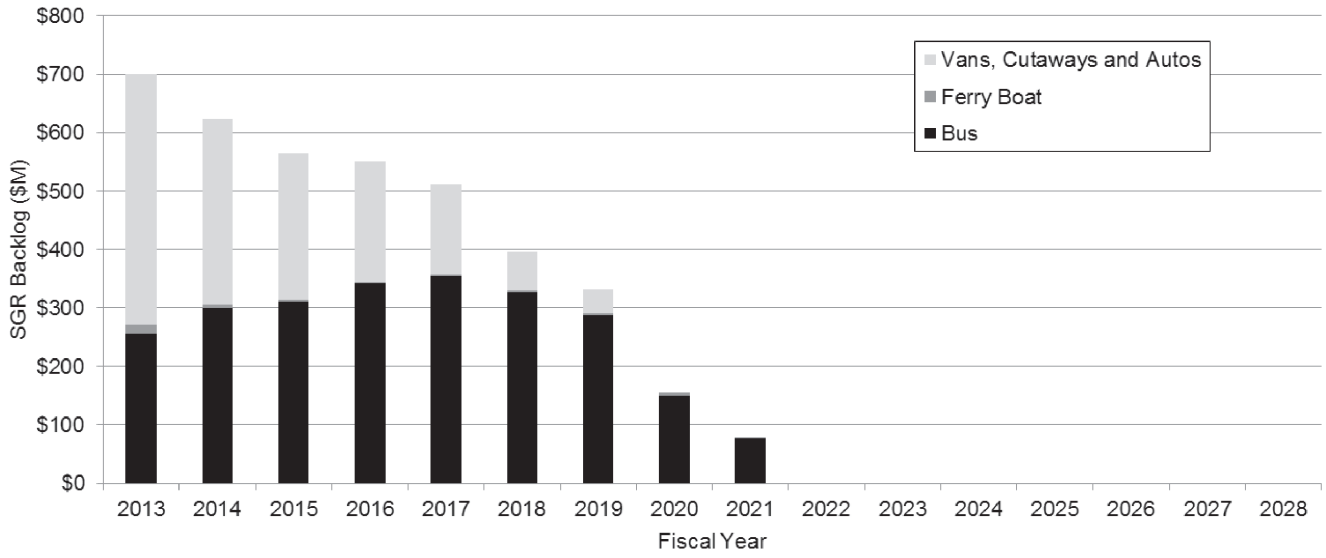
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-8 Percentage of assets in marginal or poor condition: Fixed Investment—Scenario 2.



Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-9 SGR backlog by vehicles and facilities: Fixed Investment—Scenario 3.



Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-10 SGR backlog by type of vehicle: Fixed Investment—Scenario 3.

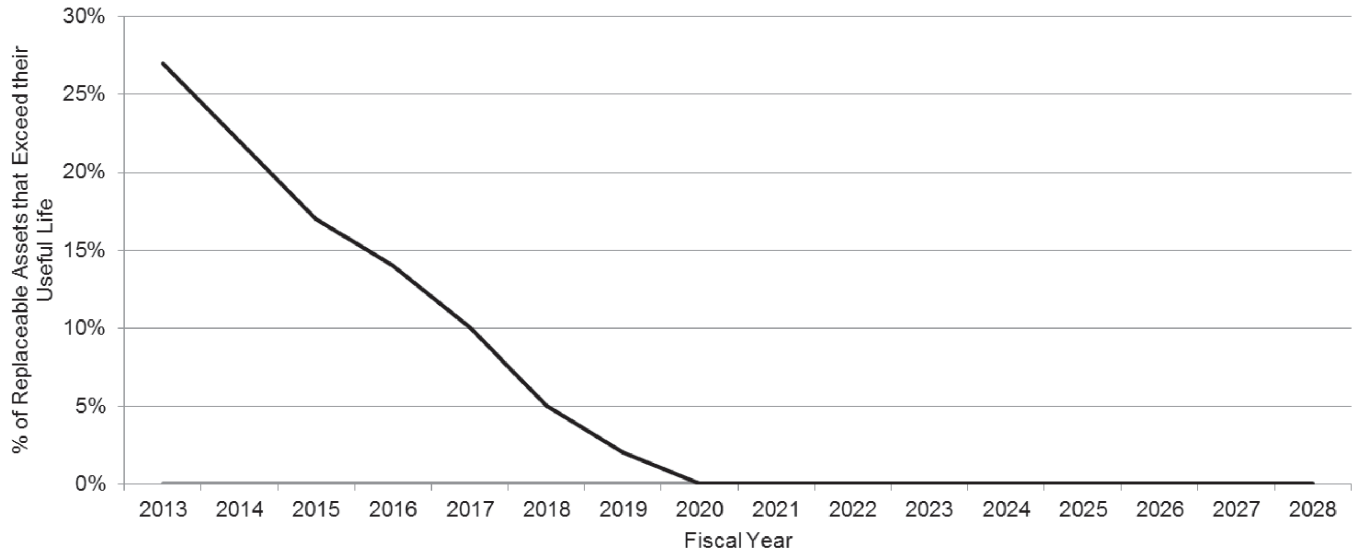
by 2023. Nevertheless, despite the elimination of the backlog within a decade, 15% of assets still remain in marginal condition 15 years after the level of investment begins. See also Figures A-10 through A-12.

Performance Scenario 1—Maintain Backlog

At funding levels sufficient to maintain the current SGR backlog for the next 15 years, the vehicle SGR backlog is actually reduced through 2028. In addition the percentage of assets that exceed their useful life is effectively reduced to zero by the end of the analysis period. See Figures A-13 through A-16.

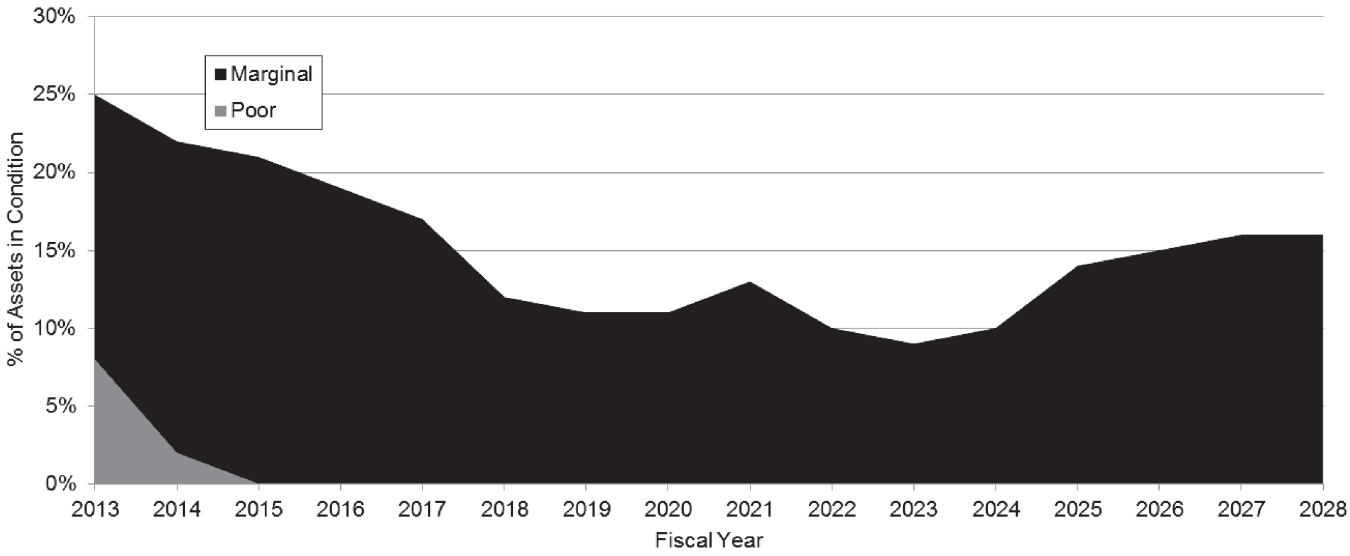
Performance Scenario 2—Eliminate Backlog

As Figure A-17 shows, the vehicle SGR backlog is actually eliminated by 2024 (although another 4 years is needed to eliminate the estimated facilities SGR backlog). See also Figures A-18 through A-20.



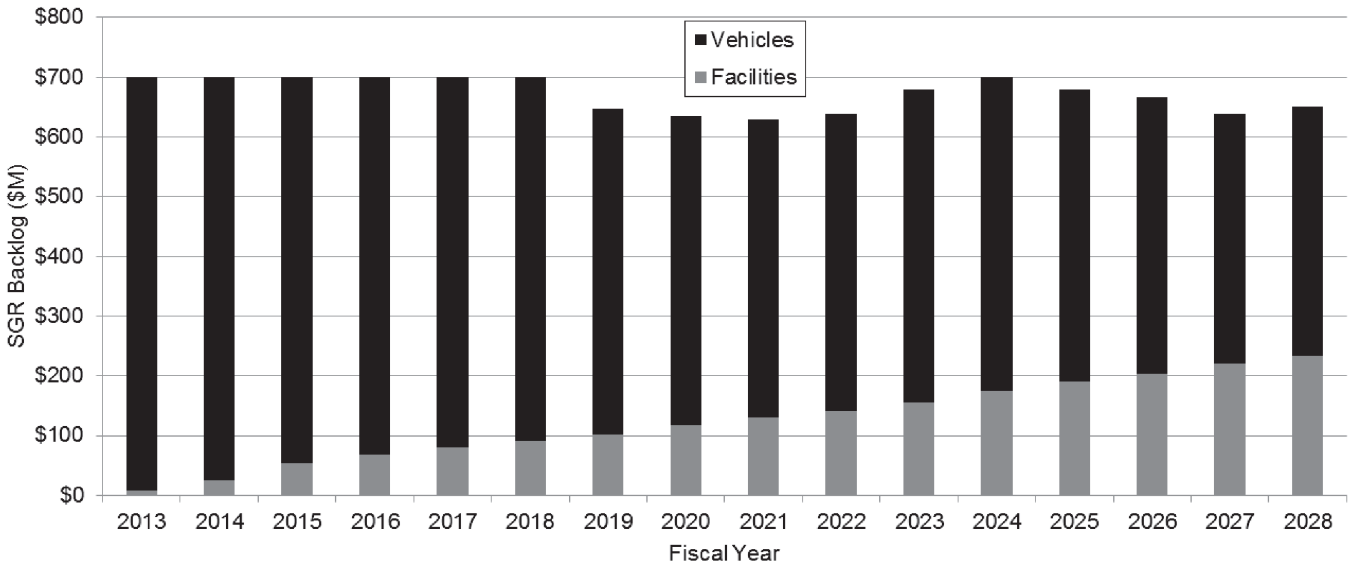
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-11 Percent of replaceable rural transit capital assets that exceed their useful life: Fixed Investment—Scenario 3.



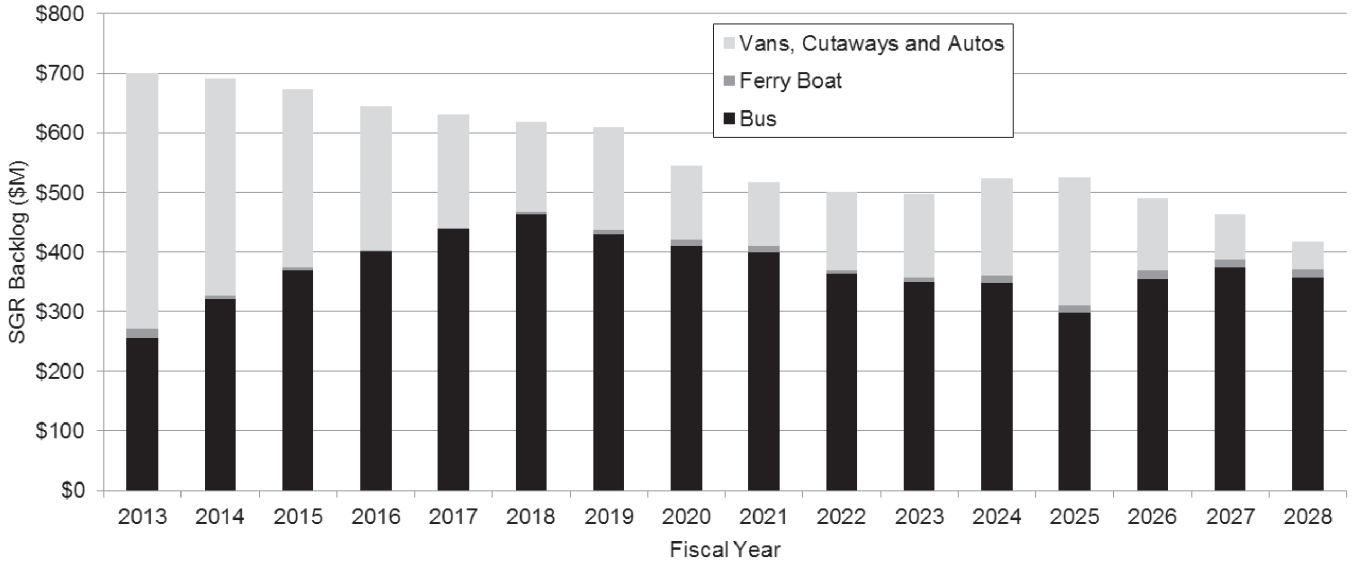
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-12 Percentage of assets in marginal or poor condition: Fixed Investment—Scenario 3.



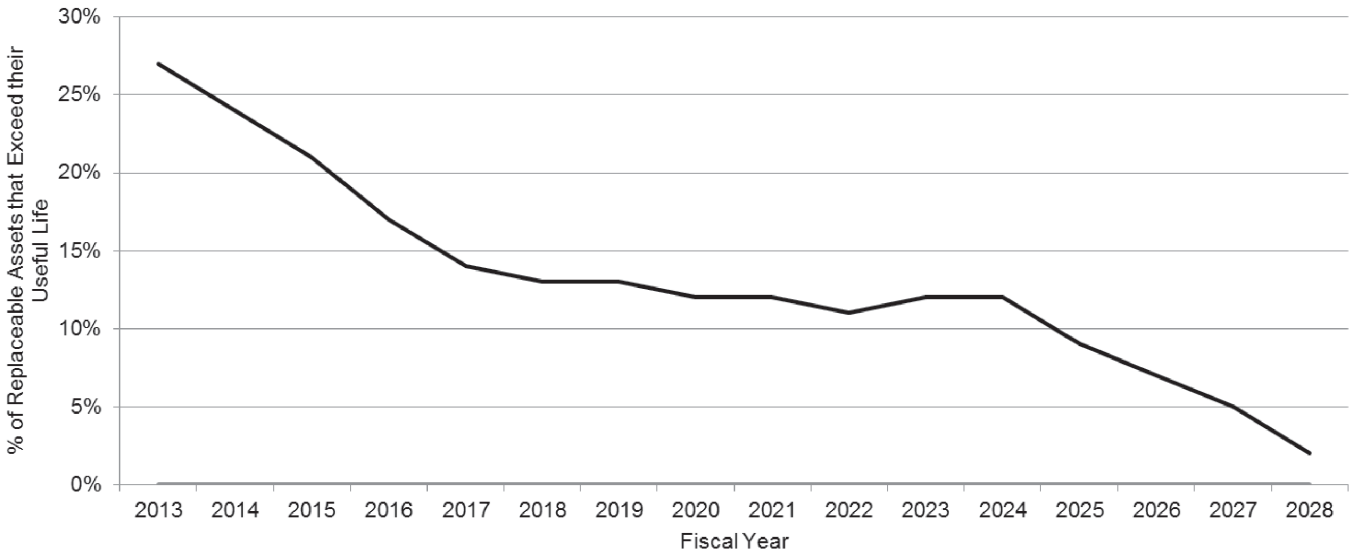
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-13 SGR backlog by vehicles and facilities: Performance Scenario 1—Maintain Backlog.



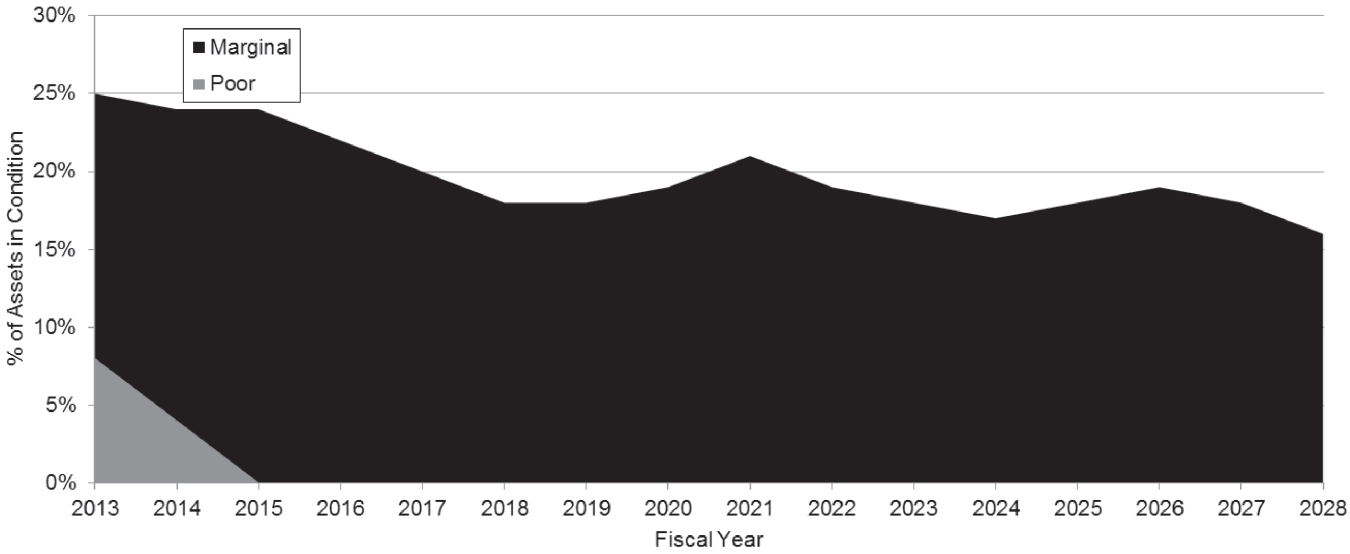
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-14 SGR backlog by type of vehicle: Performance Scenario 1—Maintain Backlog.



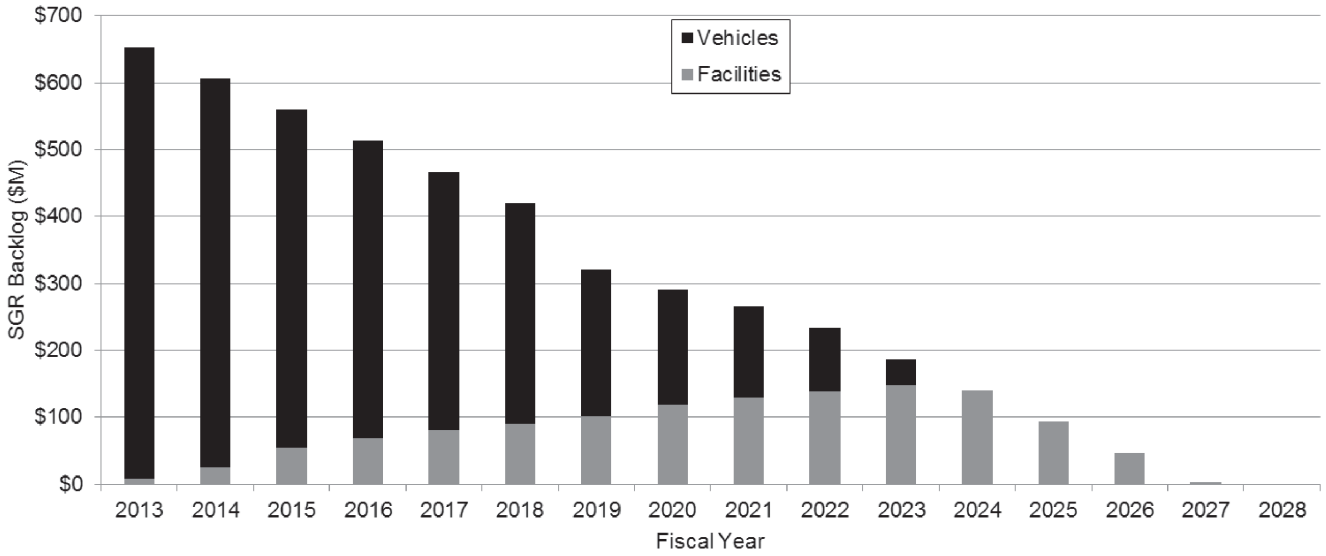
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-15 Percent of replaceable rural transit capital assets that exceed their useful life: Performance Scenario 1—Maintain Backlog.



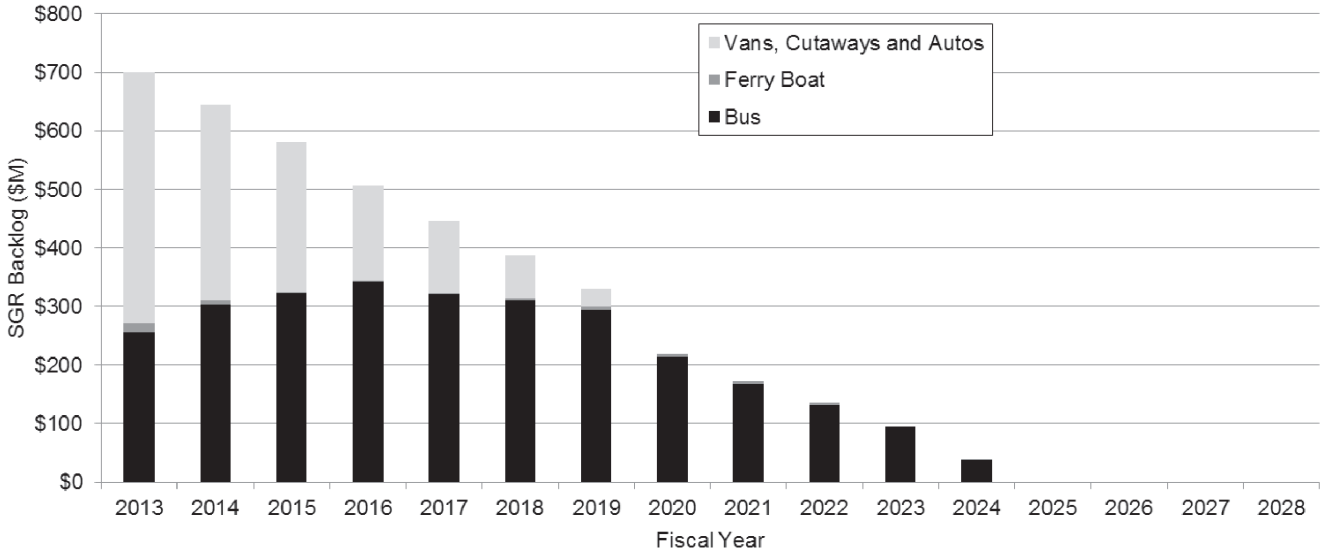
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-16 Percentage of assets in marginal or poor condition: Performance Scenario 1—Maintain Backlog.



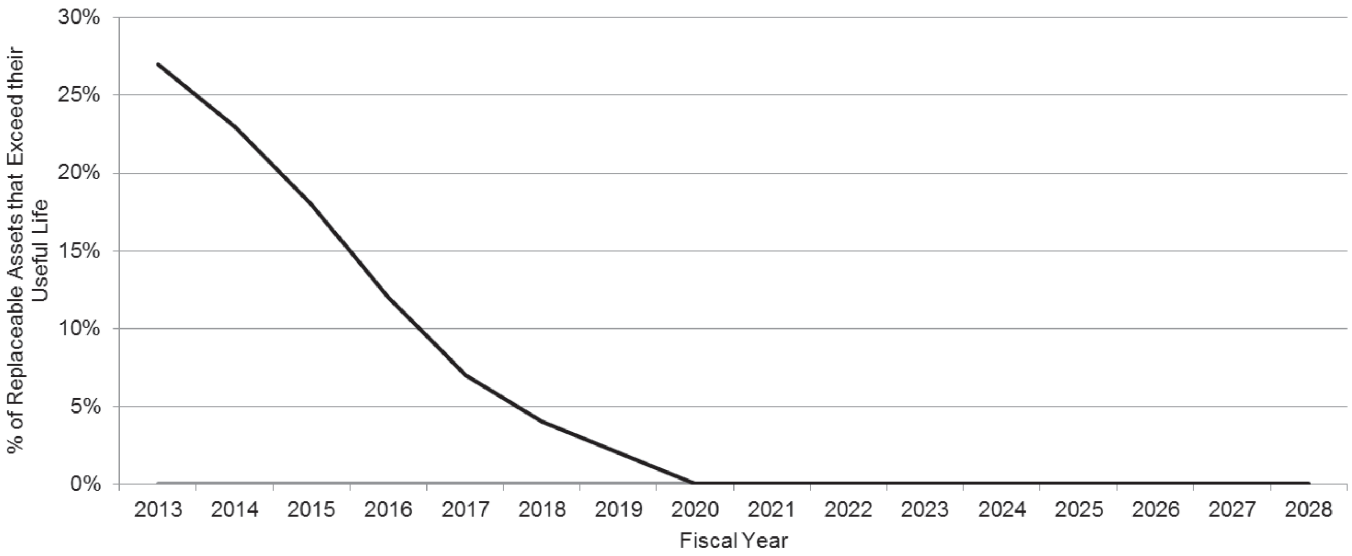
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-17 SGR backlog by vehicles and facilities: Performance Scenario 2—Eliminate Backlog.



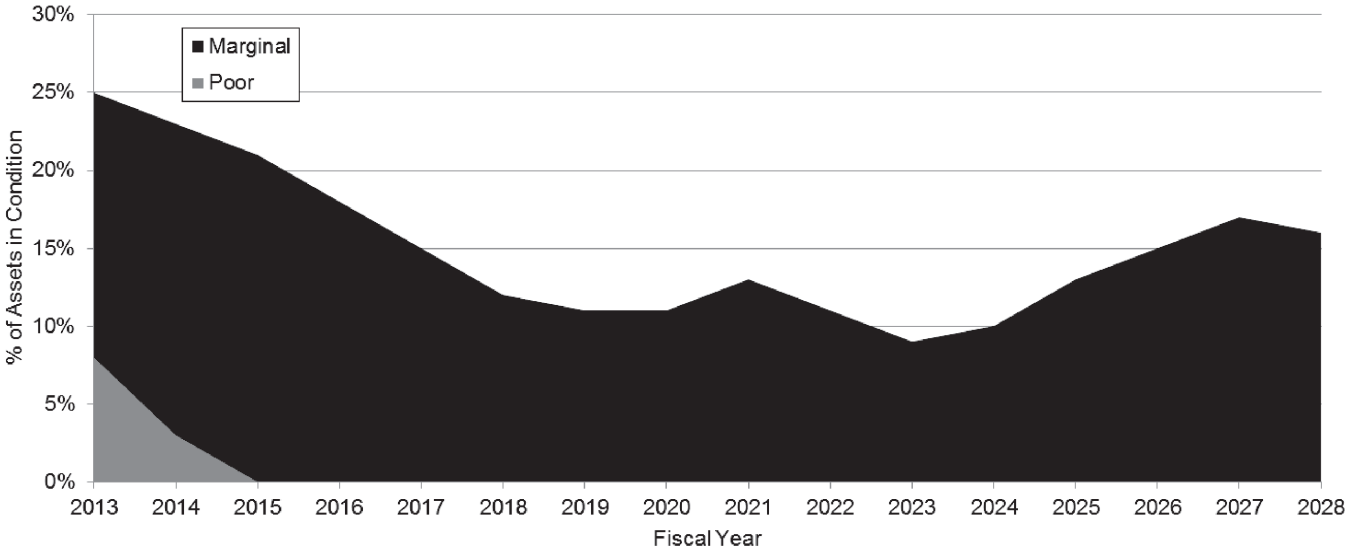
Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-18 SGR backlog by type of vehicle: Performance Scenario 2—Eliminate Backlog.



Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-19 Percent of replaceable rural transit capital assets that exceed their useful life: Performance Scenario 2—Eliminate Backlog.



Source: U.S. Department of Transportation, Federal Transit Administration, National Transit Database

Figure A-20 Percentage of assets in marginal or poor condition: Performance Scenario 2—Eliminate Backlog.

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