Georgia Institute of Technology

Prof. Laurie A. Garrow
School of Civil and Environmental Engineering
790 Atlantic Drive
Atlanta, GA 30332-0355
phone: 404-385-6634
e-mail: laurie.garrow@ce.gatech.edu

December 19, 2019

Dear Colleagues,

From 2017-2019, the Georgia Department of Transportation funded a study entitled "A Statewide Assessment of Public Transit Funding Needs for Counties Trending Urban in Georgia." The original objective of this study was to forecast future transit funding for the state of Georgia after the 2020 decennial census. However, as we embarked on this study, it became clear that the trends we were seeing in Georgia applied across the nation, and that a national-level assessment would be needed to fully understand how spatial and temporal changes of the population from the 2010 and 2020 decennial censuses would impact funding for the Federal Transit Administration (FTA) § 5311 rural and FTA § 5307 urban transit programs. Consequently, this draft final report forecasts funding requirements for the FTA § 5311 and FTA § 5307 programs after the 2020 decennial census for each state in the U.S. and identifies rural areas in each state that could become enveloped into large areas after the 2020 decennial census. The latter is important because rural transit agencies that shift to large urban areas after the 2020 decennial census will lose their ability to use federal funding for operating expenses for two years due to the "100 bus rule."

The ultimate goals of this research are to: (1) help rural transit agencies, state departments of transportation, and metropolitan planning organizations prepare for potential funding changes after the 2020 decennial census; and (2) promote regulatory reform that more fully considers the "trending urban" issue when considering federal funding for transit operating expenses. To help facilitate these goals, this report includes a set of appendices that any government agency can use to understand what the potential changes in FTA funding after the 2020 decennial census mean to their constituents. These appendices include the predicted changes in FTA § 5311 and FTA § 5307 funding, as well as the list of urban clusters that are predicted to grow into small urban areas and/or be absorbed into large urban areas.

GDOT has given us permission to release a draft of the final report for review and comment. If you have feedback on the report, feel free to contact me at laurie.garrow@ce.gatech.edu. I look forward to hearing your input and engaging in dialog as to how we can best advocate for funding for our transit systems across the nation.

Sincerely,

Laurie A. Garrow
Professor of Civil and Environmental Engineering
Georgia Institute of Technology

GEORGIA DOT RESEARCH PROJECT 17-01

FINAL REPORT

A STATEWIDE ASSESSMENT OF PUBLIC TRANSIT FUNDING NEEDS FOR COUNTIES TRENDING URBAN IN GEORGIA

Georgia Department of Transportation

OFFICE OF PERFORMANCE-BASED MANAGEMENT AND RESEARCH
15 KENNEDY DRIVE
FOREST PARK, GA 30297-2534

GDOT Research Project No. RP-17

Draft Final Report

A STATEWIDE ASSESSMENT OF PUBLIC TRANSIT FUNDING NEEDS FOR COUNTIES TRENDING URBAN IN GEORGIA

By
Laurie A. Garrow
Professor

and

Thomas Douthat
Research Engineer

and
Sara Douglass Lynch and Anna Nord
Master's Students

Georgia Institute of Technology

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Georgia Department of Transportation

In cooperation with

U.S. Department of Transportation
Federal Highway Administration

December 2019

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Georgia Department of Transportation or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

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16. Abstract:
This study predicts how spatial and temporal population changes from the 2010 and 2020 decennial censuses will impact funding for the Federal Transit Administration (FTA) § 5311 rural and FTA § 5307 urban transit programs, both in Georgia and nationwide. Binary logit models and geographic information system (GIS) methods were used to predict which areas of the U.S. will be classified as rural, small urban, or large urban after 2020. This information was then used to forecast funding requirements for the FTA § 5311 and FTA § 5307 programs after the 2020 decennial census and to identify rural areas that could become enveloped into large areas after the 2020 decennial census. The latter is important because rural transit agencies that shift to large urban areas after the 2020 decennial census will lose their ability to use federal funding for operating expenses for two years due to the “100 bus rule.” Results show that amount of additional funding needed for the FTA § 5307 small urban will be $344M–$411M, representing a 28%–33% increase over current levels. This report includes a set of appendices that any government agency can use to understand what the potential changes in FTA funding after the 2020 decennial census mean to their constituents. These appendices include the predicted changes in FTA § 5311 and FTA § 5307 funding for each state, as well as the list of urban clusters that are predicted to grow into small urban areas and/or be absorbed into large urban areas.

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LIST OF SYMBOLS AND ABBREVIATIONS

§	"Section"
ARC	Atlanta Regional Commission
BEA	Bureau of Economic Analysis
DOT	Department of Transportation
FAST	Fixing America's Surface Transportation
FTA	Federal Transit Administration
GIS	Geographic Information System
LEHD	Longitudinal Employer–Household Dynamics
LODES	LEHD Origin–Destination Employment Statistics
LSAD	Legal/Statistical Area Description
LU	Large Urban
MAP-21	Moving Ahead for Progress in the 21st Century
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
NHGIS	National Historical Geographic Information System
NTD	National Transit Database
PM	Passenger Mile
PSQM	People per Square Mile
RTAP	Rural Transportation Assistance Program
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for User
STIC	Small Transit Intensive Cities

SU	Small Urban
TIGER	Topologically Integrated Geographic Encoding and Referencing system
UA	Urbanized Area
UACE	Urban Area Census
UC	Urban Cluster
VRH	Vehicle Revenue Hour
VRM	Vehicle Revenue Mile

EXECUTIVE SUMMARY

In the United States (U.S.), there are two main sources of transit funding administered by the Federal Transit Administration (FTA). The amount of FTA funding a transit agency receives depends, in part, on whether the agency serves an area that is designated as rural, small urban, or large urban. These designations are defined using the most recent decennial census.

Between 2000 and 2010, the percentage of the U.S. population residing in urban areas increased by over 12% (U.S. Census Bureau 2011b). Population forecasts suggest these trends will continue and will be reflected in the 2020 decennial census. This project examines how spatial and temporal changes in the U.S. population will impact funding for transit systems in the U.S. after the 2020 decennial census. We use binary logit models and geographic information system (GIS) methods to predict spatial and temporal population changes between 2010 and 2020 and identify which areas of the U.S. will be classified as rural, small urban, or large urban after 2020. We then use this information to forecast how appropriations for FTA § 5311 (rural) and § 5307 (urban) formula funding programs could change after the 2020 decennial census. These forecasts are summarized in Table ES-1. The estimates in Table ES-1 assume that the current appropriation formulas and FY19 FTA data values are used; the FTA data values convert each input used in the appropriation formula into a dollar amount, e.g., each rural person translates to $4.72 in appropriation dollars. Under these assumptions, the total amount of federal funding needed to support transit after 2020 using today's funding appropriation formulas is basically unchanged;

however, there would be large changes within the individual programs. These changes are reflective of population trends in the U.S.: the outward expansion of cities and overall decline of rural populations results in additional transit support that is needed for small urban areas (defined as those with populations between 50K and 200K) and large urban areas (populations between 200K and 1M).

TABLE ES-1

Summary of Predicted Changes in FTA § 5311 and § 5307 Funding After 2020

Funding Source (Population)	Current Appropriation*	Predicted Appropriation	Difference	% Difference
5311 rural (<50K)	629M	483 to 505M	−124 to −146M	−20 to −23
5307 small urban (50K–200K)	402M	550 to 608M	148 to 206M	37 to 51
5307 large urban (200K–1M)	839M	1.035 to 1.044B	196 to 205M	23 to 24
5307 large urban (1M+)	3.38B	3.00 to 3.06B	−316 to −358M	−9 to −11
TOTAL	5.25B	5.13 to 5.16B	−118 to −71M	−1.4 to −2.2

*Note: The numbers reported on the table above do not include the 5340 growing states portion in the totals.

As part of this study, we also conduct an in-depth analysis of those rural areas in the U.S. that are trending urban and show how the rapid low-density urbanization of places that were previously designated as rural is not fully contemplated in current transportation-planning regulations. Due to the geographic expansion of metropolitan areas, many cities and counties that were classified as rural (or non-urbanized) in the 2010 decennial census could become enveloped into large urban areas after the 2020 decennial census. This is important because rural transit agencies that shift to large urban after the 2020 decennial census will lose their ability to use federal funding for operating expenses for two years after the appropriation of funds based on the 2020 decennial census and will see significant reductions in years three and beyond (FTA 2015). The “100 bus rule” creates this effect as it caps federal funding for large urban systems, whereas rural systems can use all of their federal transit funding to help cover operating expenses (FTA 2015). The loss of operations funding could be challenging for rural transit systems, especially for those that do not receive any local funding support.

The ultimate goals of this research are to: (1) help rural transit agencies, state departments of transportation, and metropolitan planning organizations prepare for potential funding changes after the 2020 decennial census; and (2) promote regulatory reform that more fully considers the “trending urban” issue when considering federal funding for transit operating expenses. To help facilitate these goals, this report includes a set of appendices that any government agency can use to understand what the potential changes in FTA funding after the 2020 decennial census mean to their constituents. These appendices include the predicted changes in FTA § 5311 and FTA § 5307 funding, as well as the list of urban clusters that are predicted to grow into small urban areas and/or be absorbed into large urban areas.

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We thank the Georgia Department of Transportation for their support, particularly Carol Comer, Leigh Ann Trainer, Nancy Cobb, Kaycee Mertz, Sunil Thapa, and Supriya Kamatkar for their helpful input. We are also grateful to those who participated in the American Association of State Highway and Transportation Officials (AASHTO) Council on Public Transportation & Multi-State Transit Technical Assistance Program (MTAP) 2019 Winter Meeting in Santa Fe and to Yvette Taylor, Robert Buckley, and Federal Transit Administration (FTA) Region IV staff who provided input into this report. Finally, we offer our thanks to Sharon Dunn who copy-edited this report.

1 INTRODUCTION

Urbanization in the United States (U.S.) has greater impacts on federal funding for public transit than may be evident. The funding implications of urbanization include shifts in overall rural transit funding by states, a reduced number of permitted expenses for the transit agencies (i.e., a loss in operating expenses, such as fuel or operator salaries), and increased reporting requirements to the National Transit Database (NTD) (FTA 2015). These implications have the power to present serious challenges to current rural transit systems that will be located in newly urbanized areas after the 2020 decennial census.

This report examines these implications and, particularly, addresses urbanizing rural areas and how public transit funding through the Federal Transit Administration's (FTA) § 5311 and § 5307 formula funding programs will be affected as a result of urbanization. Transit systems located in fast-growing non-urbanized[1] areas, and non-urbanized areas that are subject to envelopment by adjacent urbanized areas are of particular focus for this analysis.

To date, very few research publications have explored the intersection of urbanization of rural areas and federal funding for transit. As such, it is our hope that the research findings presented in this analysis will be useful in highlighting issues that urbanization can have on FTA rural transit funding and help states better prepare for potential changes after the 2020 decennial census.

[1] In this report, we use the terms rural and non-urbanized interchangeably.

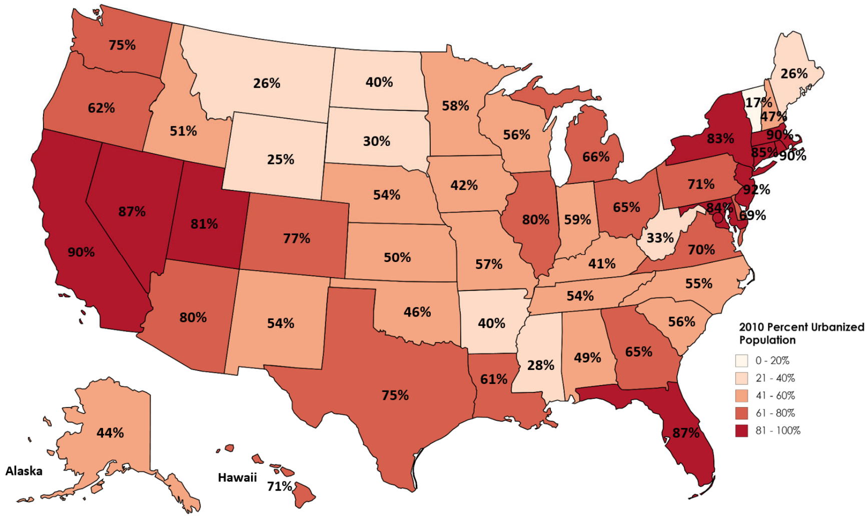
This report contains five chapters. Chapter 2 explores urbanization trends in the U.S. since 2000; clarifies definitions of “urban” and “rural”; and provides background on FTA’s § 5311 and § 5307 formula funding programs, and describes the allocation process for each. Chapter 3 describes the data and methodology we used to forecast land use changes and resulting implications on statewide transit funding. Chapter 4 presents the results, which include a forecast of how state-level appropriations for FTA’s § 5311 (rural) and § 5307 (urban) formula funding programs will change after the 2020 decennial census and funding gap estimates for individual transit providers and counties in Georgia. The analysis is accompanied by several technical appendices of results that will be of particular interest to state agencies for understanding how population trends in their states could impact their constituents. Chapter 5 summarizes the key findings and offers recommendations for regulatory changes that would help transit agencies make a smoother transition from a system that operates in a rural area to one that operates in a large urban area.

2 LITERATURE REVIEW

This chapter reviews population growth trends in the U.S., describes key differences in funding for rural and urban transit systems, and explains how operating funding gaps can occur for rural transit systems absorbed into large urban areas after the 2020 decennial census.

2.1 U.S. Population Trends

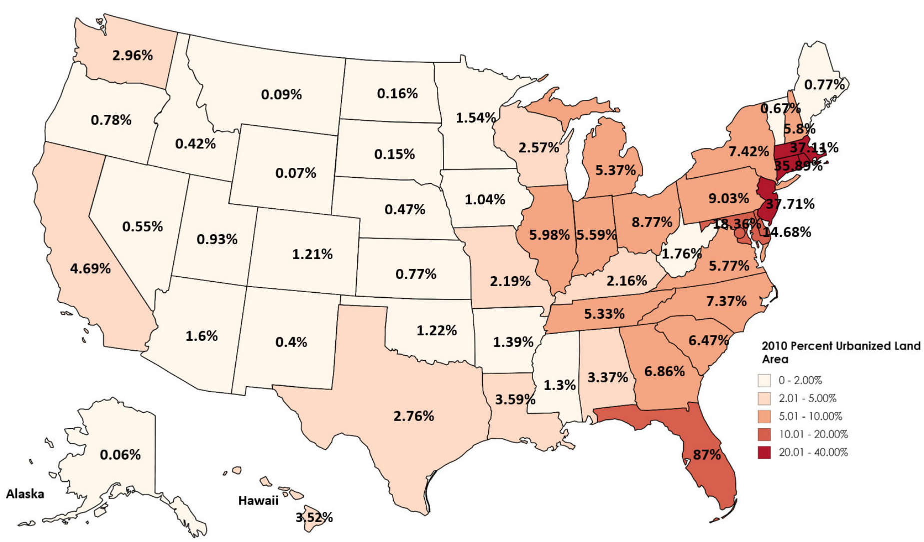
In the first decade of the twenty-first century, the total population in the U.S. grew by 9.7% (U.S. Census Bureau 2011b). Additionally, the overall urbanized population in the U.S. grew from 79.0% to 80.7% and the overall rural population decreased from 21.0% to 19.3%. Also, during this decade, there was a 19% increase in overall urbanized land area (U.S. Census Bureau 2015). Maps showing the distribution of urbanized population and land area in 2010 are illustrated in Figure 1 and Figure 2, respectively. The states with the highest percentage of urbanized population include New Jersey (92%), Rhode Island (90%), Massachusetts (90%), and California (90%), with Vermont (17%), Wyoming (25%), Montana (26%), and Maine (26%) as the states with the lowest percentage of urbanized population. The percent of urbanized land area by state is markedly lower than urbanized population, meaning that urbanized population is concentrated to geographic areas within the state. Urbanized land area ranges from less than 1% in 10 states (most of which are in the western U.S.) to over 37% in the eastern states of New Jersey and Rhode Island.



Sources: Mapchart.net 2019; U.S. Census Bureau 2010, 2017.

FIGURE 1

Percent Urbanized Land Population in 2010 by State in the U.S.



Sources: Mapchart.net 2019; U.S. Census Bureau 2010, 2017.

FIGURE 2

Percent Urbanized Land Area in 2010 by State in the U.S.

This trend of urbanization in the U.S. is not new; in fact, the U.S. has been urbanizing since 1830, with a short respite between 1930 and 1940 (Boustan, Bunten, and Hearey 2013). These urbanization trends are expected to continue through 2020 and beyond. The objective of this project is to predict: (1) the changes in urbanized population and land area that will be reflected in the 2020 decennial census, and (2) how funding for FTA's § 5311 and § 5307 programs will also change.

2.2 How the FTA § 5311 and § 5307 Programs Relate to the Decennial Census

The FTA provides funding for public transit systems through the Fixing America's Surface Transportation (FAST) Act, signed into law in 2015 (FTA n.d. (b)). Through the FAST Act, eligible entities can apply for dozens of competitive or formula grants (FTA n.d. (a)). Two of the largest programs are the FTA § 5307 Urbanized Area Formula Funding program and the FTA § 5311 Formula Grants for Rural Areas. The FTA and the U.S. Census Bureau use similar criteria to define rural and urbanized areas, but there are important distinctions between their definitions. Using block-level geography, the U.S. Census Bureau defines areas with a population under 50,000 as urban clusters (UCs) and areas with a population over 50,000 as urbanized areas (UAs) (U.S. Census Bureau, 2011a), and all others as rural. The FTA defines eligibility for § 5311 (rural) and § 5307 (urban) programs using the most recent decennial census. Eligibility for the § 5311 (rural) grants includes those areas with populations less than 50,000; this includes UCs and rural areas, so some places classified as UCs by the U.S. Census Bureau are rural for the FTA.

The FTA defines eligibility for the § 5307 (urban) grants as those areas classified as contiguous urbanized areas with populations greater than or equal to 50,000 (49 USC

§ 5302(23)). Any area with a population less than 50,000 is classified as non-urbanized (49 USC § 5311) (FTA 2018, 2019g, 2019h). So, the primary programmatic binary is urbanized and non-urbanized (smaller than 50,000), but the § 5307 program also distinguishes between small urbanized areas (small UAs) with a population of at least 50,000 and 199,999, and large urbanized areas (large UAs) with populations of 200,000 or more (FTA 2017, 2018).

The shift from rural to urban after a new decennial census can present planning challenges. Reporting requirements are markedly higher, and the ability to use FTA funding for operating expenses is more limited for systems serving urbanized areas with populations over 200,000 than for § 5307 small urbanized area systems and non-urbanized areas (FTA 2017, 2018). Further, because § 5311 and § 5307 small urbanized funds are appropriated to state governors while § 5307 large urbanized funds are apportioned directly to regional recipients (such as metropolitan planning organizations [MPOs] or operators), rural transit operators that are absorbed into a large urban area need to coordinate directly with the local MPO.

With respect to reporting requirements, the § 5307 and § 5311 programs require different levels of reporting to the National Transit Database [NTD]. As of FY18, all transit systems, regardless of type of funding, are required to report operational, service, fleet, and asset management information to the NTD (49 CFR 5307). Reporting requirements are fewer for § 5311 recipients and are typically completed by the state department of transportation (DOT), whereas § 5307 recipients usually self-report their data directly to the NTD. This level of reporting requires extensive metrics tracking and a dedicated staff to compile and submit the data, which could be taxing on a rural transit system that is newly urbanized if staff resources are limited.

With respect to operating expenses, in the § 5311 program rural transit operators are permitted to use up to 100% of their FTA funding on eligible operating expenses. Under the § 5307 program, recipients are not permitted to use FTA funds for operating expenses *except* under the stipulations set forth by the "100 bus rule" that was introduced under the Moving Ahead for Progress in the 21st Century (MAP-21) legislation passed in 2012 and slightly modified with the FAST Act passed in 2015. Grants under the § 5307 (urban) program can be used to finance operating costs for public transportation systems that "operate 75 or fewer buses in fixed route service or demand responsive service, excluding complementary paratransit service, during peak service hours, in an amount not to exceed 75% of the share of apportionment which is attributable to such systems within the urbanized area, as measured by vehicle revenue hours" (FTA 2017). A similar rule applies to systems that operate a minimum of 76 and maximum of 100 buses; in this case, no more than 50% of the share of apportionment can be used toward operating costs.

Total urban vehicle revenue hours (VRHs) are used to determine the portion of funding that can be used toward operating expenses. Note that federal regulations explicitly dictate that the share of apportionment is to be determined *using VRHs based on reporting to the urban National Transit Database two years beforehand.* This is the regulatory language that will give rise to operating funding gaps after the 2020 decennial census.

2.3 How Funding Gaps Can Occur After the 2020 Decennial Census

Funding gaps after the 2020 decennial census can occur due to distinctions between the *generation (*or *apportionment*) and the *allocation* of funds. The total amount of § 5311 funding a state DOT receives for its rural transit system depends on various factors defined in the § 5311 formula grant program, i.e., funds are apportioned based on population, land area, low-income population, and vehicle revenue miles (VRMs) criteria. However, the state DOT determines how to *allocate* these funds to particular transit agencies and can use different factors than those used in the allocation formula.[2]

A similar system exists in the case of small urbanized systems, but large urbanized systems are different because their funding also depends on historical VRMs reported to the NTD, and they are restricted in how much they can spend on operations by the 75 bus rule or 100 bus rule. To understand how a funding gap occurs after the 2020 census, consider a rural transit system that learns its previously rural, or non-urbanized, service area has merged with a large urbanized area. The transit system can no longer apply for funding under the § 5311 program administered by its state DOT and must apply for funding under the § 5307 program and coordinate with its local MPO or other regional transit agency (FTA 2016, 2018).

The MPO is responsible for determining how to allocate § 5307 funds to eligible recipients. If the MPO has a policy in which it allocates funds based solely on the urban

[2] For example, consider two transit systems that generate the same amount of § 5311 funds and provide the same number of trips. One agency serves a population that is 100 miles from a major medical facility, whereas the other agency serves a population that is about five miles from a major medical facility. Logically, operating costs will be much higher for the first agency, and the state DOT can allocate more funds to this transit system (even though the two systems would have generated identical funds under the formula).

funds that the agencies had generated for the § 5307 program, the formerly rural transit system—although now permitted to receive § 5307 funds—would not be eligible under the MPO's policy, since it has not yet generated any funds for the urban program.[3] Importantly, even if the MPO allocated funding to the transit agency as soon as it became eligible for § 5307 funds, ***the transit agency could not use any of its § 5307 funds for operating expenses***. The § 5307 formula program uses (urban) VRHs to determine the amount of § 5307 funding that can be used toward operating expenses, but since the transit system has not yet provided service under the § 5307 program, it does not have any urban VRHs to report. Consequently, the formerly rural transit system would need to provide service for two years before it could receive § 5307 operating funds. This two-year lag occurs until the NTD is able to certify the accuracy of urban service data and calculate the amount of apportionment that can be used toward operating expenses. Thus, a system that operates in urbanized areas in 2020 would submit these data to the NTD in 2021, and the certified NTD data could then be used in the 2022 allocations.

We classify those rural transit systems that will have their service areas transition to urban areas after the 2020 census into one of three categories. *High-risk transitions* occur when a rural transit system is absorbed into a large urbanized area. Transit systems in this category are at risk of losing federal operating assistance for two years (due to the 75 or 100 bus rule) and experiencing a reduction in operating assistance after year two. *Medium-risk transitions* occur when a small urbanized transit system grows into a large urbanized system. Transit systems in this category are at risk of seeing a reduction in operating

[3] In 2018, this is how the Atlanta Regional Commission (ARC) distributed § 5307 urban funds within the Atlanta metro area. (Atlanta Regional Commission 2018).

assistance (as competition for large urbanized funding tends to be higher than for the rural and small urbanized program, and only small urbanized systems are eligible for Small Transit Intensive Cities [STIC] funding). *Low-risk transitions* occur when a rural system grows into a small urbanized system. Transit systems in this category may still use their FTA § 5311 funds for operating expenses. Figure 3 shows the different types of transitions.

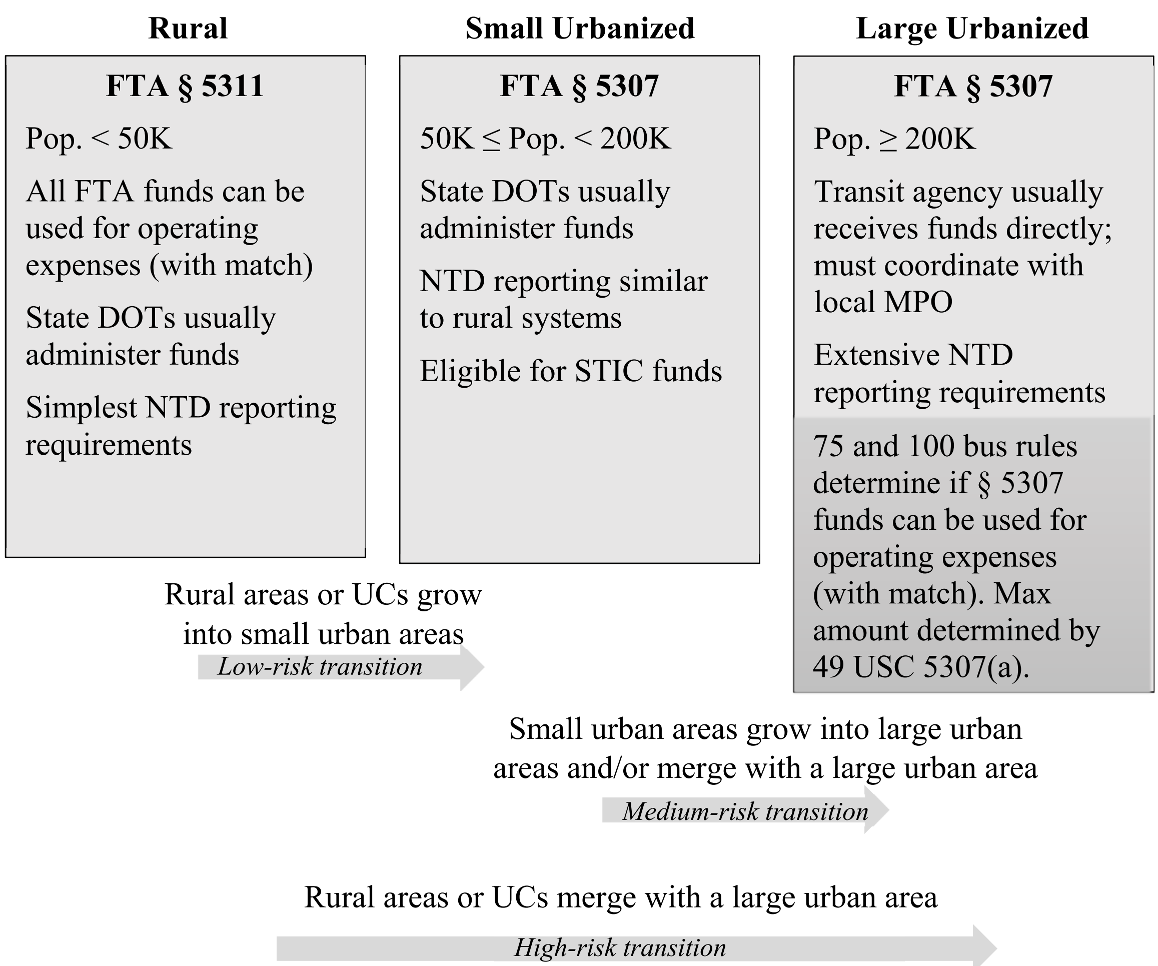


FIGURE 3

How the 2020 Decennial Census Can Impact Funding for Rural and Small Urbanized Transit Systems

2.4 Summary

The continued outward expansion of urban areas, combined with the distinct eligibility criteria for FTA § 5311 (rural) and § 5307 (urbanized) programs could lead to systematic funding challenges throughout the nation after the 2020 decennial census. If a system loses its § 5311 rural funding, it can theoretically just transition into § 5307 funding after it is urbanized. Although this sounds like a simple and feasible solution, there are several limitations:

1. The MPO, which now determines allocation for the newly urbanized transit system, could choose not to allocate any funding to the operator "because it had not yet generated any funds for the urban program."
2. Although the MPO did allocate funding to the newly urbanized transit system, the transit agency could not use any of its § 5307 funds for operating expenses. This is because the system has not yet generated any *urban* vehicle revenue miles, which is one of the inputs that is used to determine how much funding can be used toward operating expenses.
3. Additionally, it takes two years for the NTD to certify and adjust funding after receiving reported urban vehicle revenue miles from the newly urbanized system (FTA 2015).

These rules and regulations leave transit systems in newly urbanized areas in a tight spot, unable to return to § 5311 funding or initiate § 5307 funding.

3 DATA AND METHODOLOGY

This chapter reviews the data and methodology we used to forecast population and land use in 2020. We used these two metrics to quantify likely implications for transit funding after the 2020 decennial census. First, we identified those areas throughout the nation that we consider to be at high risk or medium risk for losing federal funding. High-risk areas include urban clusters (classified as "rural" by the FTA) absorbed into a large urbanized area. Medium-risk areas include small urban areas that grow into or merge with a large urban area. Next, we performed a deeper assessment of county-level funding implications for the state of Georgia, and predicted operating funding gaps for specific counties and transit operators that are in areas trending urban. Finally, we forecast overall changes in the state-level § 5311 (rural) and § 5307 (urban) FTA appropriations.

Figure 4 provides an overview of our methodology. Because the service area (or counties) served by individual rural transit providers is not collected as part of the NTD, we could only calculate overall funding levels for the § 5311 and § 5307 programs at the state level. However, we did have this information for Georgia, and, thus, could predict overall funding levels and operating funding gaps for individual counties and rural service providers. Because the outward growth in the Atlanta metro area is spilling over into other metro areas, we visually inspected the results from the binary logit models and assigned new urban blocks to the most appropriate metro area using a grandfathering clause the U.S. Census Bureau applied in 2010. The key distinction between the left and right sides of the flowchart in Figure 4 is that we were able to do a more refined analysis for Georgia.

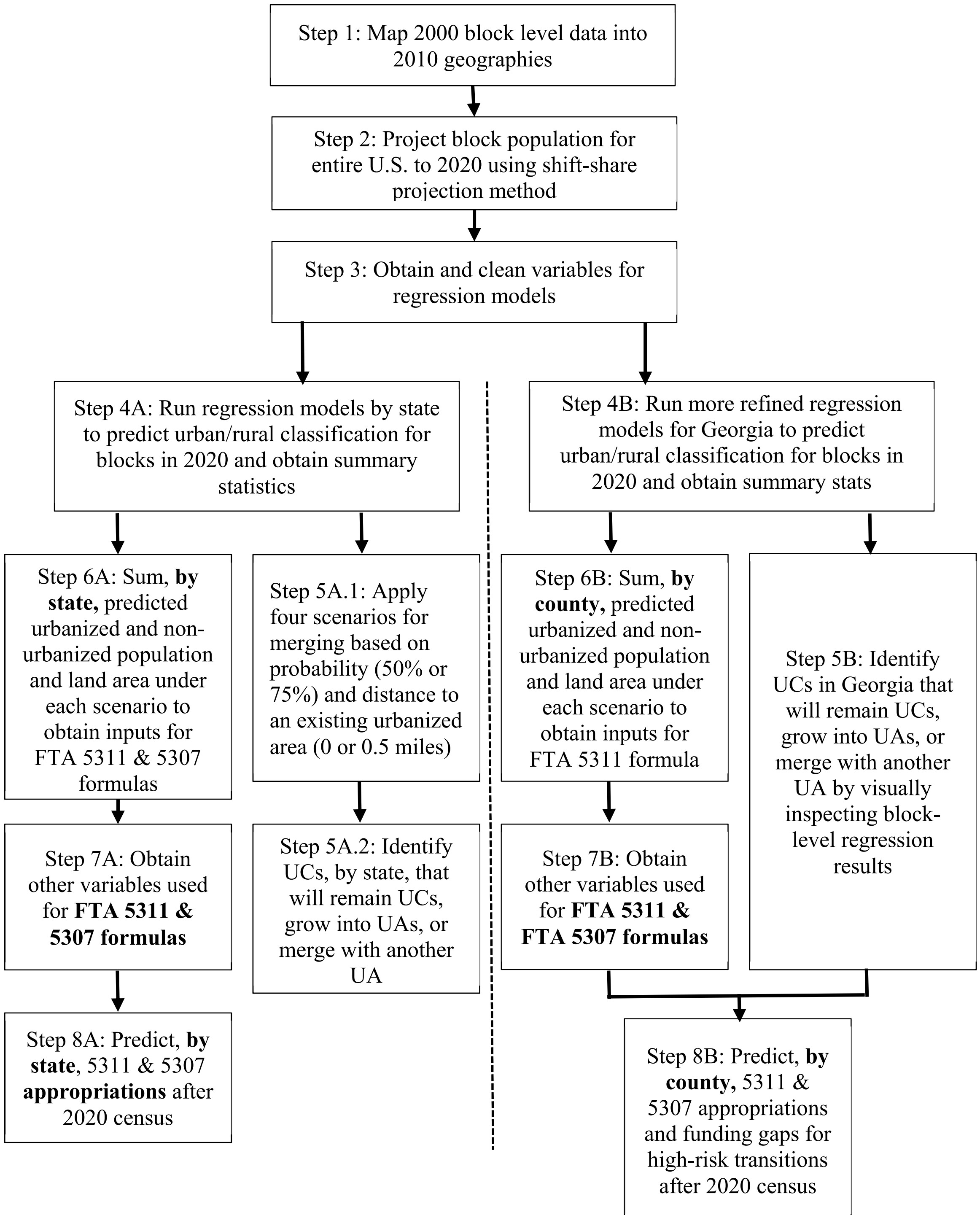


FIGURE 4

Flow-chart Illustrating Overview of Methodology

At this stage in the discussion, it is helpful to distinguish between the binary logit model used for calibration (or obtaining binary logit model coefficients) and the binary logit model used for prediction (or forecasting whether a tract will be urban or rural in 2020). Note that in the calibration model, we used data from 2000 and 2010 (as all of the variables are known). In the forecasting model, we used data from 2010 and 2020. However, since the variables for 2020 are not known, we needed to prepare forecasts for the 2020 variables in order to use the binary logit model. The steps shown in Figure 4 before the binary logit model were focused on preparing data inputs.

We discuss each of the modeling steps shown in Figure 4 in detail in the sections that follow. The majority of the data cleaning and analysis steps described in this chapter were conducted in R Studio, and complemented by ESRI's ArcMap 10.5.1 (R Core Team 2018; ESRI 2017).

3.1 Step 1: Map 2000 Block Level Data into 2010 Geographies

To predict whether a block will be urban or rural after the 2020 decennial census, we estimated binary logit models that were based on 2000 and 2010 data. That is, we first predicted the land use status (rural or urban) as of 2010 by using 2000 data as an input. However, because the geographies representing blocks between decennial censuses change, we first needed to map 2000 data into 2010 geographies using a cross-walk file from the National Historical Geographic Information System (NHGIS) (Manson et al. 2019). The cross-walk file essentially provides information on how blocks from the two censuses relate to each other. We used the 'stringr' package in R for mapping the 2000 block-level data into the appropriate 2010 geographies (Wickham 2018). Excluding

Puerto Rico and the Island Areas, in 2000, the U.S. had a total of 8,205,582 blocks in the U.S., whereas in 2010, it had a total of 11,078,297 blocks (U.S. Census Bureau 2001; 2011a).

3.2 Step 2: Estimate Block-Level 2020 Populations Using the Shift-share Method

After binary logit models were estimated, we used the coefficients from these models, along with updated variables, to predict the probability that a block will be urban in 2020. Thus, as part of the initial data pre-processing, we needed to estimate block-level 2020 populations so that we could forecast input variables related to population and population densities as of 2020. The shift-share projection method is a type of ratio time-series model that is used to project population (or employment) to a given year for a geographic area using a larger geographic reference area (Smith, Tayman, and Swanson 2001). Equation 1 is the formula for the shift-share method, where *P* = population, *i* = smaller area (census block), *j* = larger area (census block group), *z* = number of years in the projection horizon, *y* = number of years in the base period, *b* = base year, l = launch year, and *t* = target year.

$$P_{it} = P_{jt}\left[\frac{P_{il}}{P_{jl}} + \left(\frac{z}{y}\right) \times \left(\frac{P_{il}}{P_{jl}} - \frac{P_{ib}}{P_{jb}}\right)\right] \quad (1)$$

To obtain the 2020 projected block population, the census block group populations for 2015 and 2020 were purchased from ESRI and used for the larger geographic reference area (ESRI 2015). Since block-level population data are not available in between decennial census years, we first projected the data to 2015 using a base year of 2000 and a launch year of 2010 (*z* = 5 years; *y* = 10 years). We then used the output from the 2015 projection to obtain a 2020 block-level projection using a base year of 2010 and a launch year of 2015 (z = 5 years; y = 5 years).

One caveat of the shift-share projection method is that blocks with declining or slow-growing population during the base period can result in a negative population projection (Smith, Tayman, and Swanson 2001). To correct for these blocks with negative population, the negative population was summed by the block group, and was then subtracted evenly from the blocks with population greater than '0'.

3.3 Step 3: Obtain and Clean Variables for Binary Logit Models

Extensive literature is available related to predicting land use (which in our case is predicting whether a tract will be urban or rural after the 2020 decennial census). Table 1 shows the variables that we included in the binary logit models for all of the states, and Table 2 shows two additional variables we included in the Georgia model. Both tables show descriptive statistics for these variables for the state of Georgia.

The final model for land use change included variables measuring population density in a block, the distance of the block to urban areas (UAs and UCs), the number of jobs in the census tract, whether a block was nearest to a UA or UC, and the distance to primary and secondary roads. Because population densities and the distance to urban areas were not normally distributed, we created dummy variables for different density levels and distances. We used the log of the distance of each block to city centers (referred to in other studies as activity centers) and all primary and secondary roads, but not local streets.

TABLE 1

Definition and Descriptive Statistics of Variables Used in State Binary Logit Models

Variable	Definition and Descriptive Statistics
2000 urban área / urban cluster (UA/UC)	Indicator variable equal to 1 if block was classified as an urban cluster or urban area in 2000, 0 otherwise. We use the population of contiguous urban blocks to calculate if the block belongs to an urban cluster or area. Of 333,150 blocks, 147,039 (40%) were urban in 2000, after removing blocks that were water and rural protected areas.
2010 UA/UC	Definition same as for 2000 UA/UC (above), but for 2010. Of 333,150 blocks, 167,987 (45.9%) were urban in 2010.
Closest urban is an urbanized area	Definition is based on the 2000 and 2010 UA/UC categories (above). Indicator variable equal to 1 if the closest planar distance of a block is to either an urban cluster or urbanized area. *In the global model,* 162,905 (44.5%) blocks were in this category; *in the rural-only model,* 50,331 (29.3%) blocks were.
Distance to nearest urban area (UA or UC)	Distance (in miles) to the nearest UC or UA as of 2000. We use the centroids of blocks and urban areas for calculating distances. *In the global model:* urban area (N=147,039, 40.0%); rural and (0,1] miles from UA (N=39,092, 10.7%); rural and [1–2) miles (N=17,746, 4.8%); rural and (2,3] miles (N=15,563, 4.3%); rural and (3,4] miles (N=14,948, 4.1%); rural and 4+ miles (N=131,762, 36.1%). *In the rural model:* borders an urban area (all have a distance of (0–1] miles) (N=38,318, 22.3%); (1–2] miles (N=17,746, 10.3%); (3–4] miles (N=15,563, 9.1%); 4+ miles (N=100,108, 58.3%).
Distance from block border to closest road	*In the global model,* the mean closest distance to a road is (1.41), with a max of (11.43), min (0), and std. dev of (1.5) miles. *In the rural-only model,* the mean is (1.3), with a max of (6.7), min (0), and std. dev of (1.54) miles. Because these data are skewed, we log-transformed them.
Jobs in census tract (2010)	*In the global model,* the mean is 879, with a max of (40,117), min of (0), and std. dev of (3.79); *in the rural-only model,* there is a mean of (5.74), max of (5,022), min of (0), and std. dev of (49.7). Because these data are skewed, we log-transformed them.
Population density	Number of people per square mile (PSQM) at the block level in 2010. *In the global model:* 500–999 PSQM (N=23,227, 6.3%); 1000–1499 PSQM (N=17,256, 4.7%); 1500–1999 PSQM (N=14,361, 3.9%); 2000–3999 PSQM (N=38,520, 10.5%); 4000+ PSQM (N=32,876, 9.0%). *In the rural-only model:* 500–999 PSQM (N=9,943, 5.8%); 1000–1499 PSQM (N=5,088, 3.1%); 1500–1999 PSQM (N=3,160, 1.9%); 2000–3999 PSQM (N=5,133, 3.0%); 4000+ PSQM (N=3,211, 1.9%).

TABLE 2

Definition and Descriptive Statistics of Additional Variables Used in Georgia Model

Variable	Definition and Descriptive Statistics
Atlanta MSA	Indicator variable equal to 1 if county was in the Atlanta metropolitan statistical area (MSA) in 2010, 0 otherwise. *In the global model,* 89,925 blocks (24.6%) were part of the Atlanta MSA, representing 29 counties; *in the rural-only model,* 30,145 blocks (17.6%) were in the Atlanta MSA. Blocks in these counties can be urban or rural.
Savannah MSA	Indicator variable equal to 1 if the county was in the Savannah MSA in 2010, 0 otherwise. *In the global model,* 7,851 (or 2.1%) of blocks were in the three counties comprising the Savannah MSA; *in the rural-only model,* 2,635 (1.5%) blocks were in this MSA.

3.3.1 Population Density

Block population density was included in the model because of its importance in the U.S. Census Bureau's rules in determining a block's urban/rural classification. Block densities were calculated by dividing the population of the block by the block's total land area in square miles for 2010. This was completed through the use of several functions, including mutate, join, group by, and summarize, within the 'dplyr' packages (Wickham, François, et al. 2018). These densities were then classified into the following groups:

- 500 to less than 1000 people/mi^2 (psm)
- 1000 to less than 2000 psm
- 2000 to less than 4000 psm
- Greater than or equal to 4000 psm

These groups follow the aforementioned population density U.S. Census Bureau thresholds for urban blocks: a block is urban if it has a population density of 1,000 psm or is located near an urban core and has a population density of 500 psm (Federal Register 2011). If a block fell into one of the categories, it was coded as '1' for its respective category and as '0' for the other categories.

For the forecasting model, we used the projected block-level population estimates (calculated in step 2) for the corresponding 2020 fields.

3.3.2 Distance to an Existing UC or UA

Along with block density, a block's distance to an existing UC or UA was used in the binary logit model. The distances for each block to the closest UC or UA was executed using the Near Analysis tool in ESRI's ArcMap 10.5.1 (ESRI 2017). Distance was calculated as the distance between the block's centroid to the border of the UA/UC, rather than to the center of the UA/UC. The distances (in miles) for each block were then classified into the following groups:

- Rural block and less than 1 mile from a UA/UC
- Rural block and less than 2 miles from a UA/UC
- Rural block and less than 4 miles from a UA/UC

Urbanization is not always contiguous, and can be segmented by roads, commercial development, or other structures (Ratcliffe et al. 2016). To account for this fact, the U.S. Census Bureau has a rule to account for these "jumps" and "hops" in urbanized land area. *Jumps* refer to areas spanning 2.5 miles along a road corridor, while *hops* refer to areas spanning no more than 0.5 mile. Under 2010 U.S. Census Bureau criteria, non-contiguous areas were subject to these rules, allowing for multiple hops, but no hops after jumps (Federal Register 2011).

As with the density categories, each block was assigned a '1' in its respective distance category and '0' for the other categories, making it binary for the binary logit input. Distances less than 3 and 4 miles were grouped because they are outside the distance of hops and jumps, but near enough to be vulnerable to conversion and urbanization.

The calibration binary logit models used the UA/UC classifications from 2000, while the forecast binary logit models used the 2010 classifications.

3.3.3 Closer to a UA versus a UC

In calculating the distance variables, the classification of the nearest area was also obtained with the use of the Near Analysis tool within ArcMap 10.5.1 (ESRI 2017). This is another variable that is used in U.S. Census Bureau criteria for defining urban and rural classification at the block level. That is, whether the nearest area was classified as a UC in 2000 or a UA in 2000 (2010 for the 2020 prediction model). The numbers '75' and '76' represent UAs and UCs, respectively, under the Legal/Statistical Area Description (LSAD) Codes. Each UA and UC in the U.S. is assigned a unique 5-digit Urban Area Census (UACE) Code, and is assigned an LSAD classification by the U.S. Census Bureau every decennial census.

If the nearest area was listed as a UA (or LSAD 75), the variable was coded as '1', whereas blocks that were nearest to a UC (or LSAD 76) were coded as '0'. The assumption here is that if a block is closer to a UA rather than a UC, it is more likely to transition urban. The calibration binary logit models used LSAD classifications from 2000, while the forecast binary logit models used 2010 LSAD classifications.

3.3.4 Distance to Primary and Secondary Roads

A block's proximity to the nearest primary and secondary roads is not a U.S. Census Bureau criterion for determining urban/rural classification, but was used as another indicator of urbanization. The nearest distance to either a primary or secondary road was also calculated using the Near Analysis tool in ArcMap 10.5.1 (ESRI 2017). The 2016 primary and secondary roads shapefile (local roads were not included) for the entire U.S. was downloaded from the TIGER/Line Shapefiles database (i.e., the Topologically Integrated Geographic Encoding and Referencing system) for the U.S. Census Bureau using the 'tigris' R package (Walker 2018). The data were then written to a shapefile using the 'sf' R package (Pebesma 2018). Data for 2016 were used rather than the 2015 roads dataset because there were no data in the 2015 file for Georgia. The assumption was made that the road network in 2020 will be similar to that in 2016. A maximum search distance of 10 miles was used in generating the near table in ArcMap. The output provided a value in miles for every block's distance to either a primary or secondary road. The distances were then natural log transformed to create binary inputs for the binary logit models. We used these logged distances for both the calibration and forecast binary logit models, as we did not expect these to fluctuate (or many new roads to have been built over the decade).

3.3.5 Census Tract Jobs

Total employment at the tract level was used as a proxy for land cover (which reveals non-populated urbanized areas such as airports or industrial parks). The land cover shapefile has not been updated since 2011, so it was not used in the analysis for potential lack of non-representativeness of the current land cover. Instead, the employment variable was used to predict non-residential urbanization. In other words, employment data can reveal tracts that contain activity, but that may not have population within the blocks that comprise the tracts.

The employment data used for the binary logit models included the total number of jobs at the U.S. Census Bureau tract level, and were retrieved from the Census Bureau's LEHD (Longitudinal Employer–Household Dynamics) Origin–Destination Employment Statistics (LODES) datasets using the 'lehdr' R package downloaded through the help of the 'devtools' package (Wickham, Hester, et al. 2018; Green and Mahomoui 2017). Tracts are only included in the LODES dataset if the tract contains at least one job.

The 2010 data were used in the calibration model. The 2010 and 2015 LODES data were used to project total tract jobs to 2020. In 2010, a total of 72,527 tracts (99.3% of all U.S. tracts) contained jobs compared to 2015, in which 72,585 tracts (99.4%) of all U.S. tracts contained jobs (U.S. Census Bureau 2015). The 2010 jobs data were available for all states except for Massachusetts, for which LODES data begin in 2011. Because of this, 2011 jobs data for Massachusetts were used in place of 2010. Similarly, 2015 jobs data were available for all states except for Wyoming, for which LODES data are only available through 2013. To obtain an estimate of 2015 jobs for Wyoming, the state employment growth rate between 2010 and 2015 (5.4%) from the Bureau of Economic Analysis (BEA) was applied to the total number of jobs in the tract (U.S. BEA 2017).

To project employment data for each tract to 2020, the crude growth rate was first calculated. For the 58 tracts in the dataset that grew from containing zero jobs in 2010 to containing one or more jobs in 2015, a total of '1' was assigned to the 2010 tract in order to calculate the growth rate. Next, the 75th percentile for the growth rate was obtained as

0.379. For tracts with a growth rate within ±37.9%, a compound interest rate formula was applied to project jobs to 2020 (Equation 2). The formula is as follows:

$$A = P(1 + \frac{r}{n})^t \tag{2}$$

where A = jobs by tract in 2020, P = total jobs by tract in 2010, r = calculated growth rate in 2010–2015, n = total times growth rate is compounded (1), t = number of years (1) (Stapel 2012). A value of '1' is used for n and t because the growth rate is already based on a five-year period.

For tracts with growth rates outside of the 75th percentile, the compound interest rate formula was not applied, as the formula would yield an unrealistic projection for 2020 jobs for those tracts that had dramatic increases or decreases in jobs. Instead, for these tracts, the total number of jobs in 2015 was either doubled or halved depending upon if the growth rate was positive of negative, respectively. Finally, after obtaining a projection for total number of jobs in 2020 for all 72,585 tracts, the variable was log transformed. While the projected jobs variable was used in the 2020 state binary logit models, the 2010 binary logit model utilized the logged 2010 jobs dataset.

3.3.6 Urban or Rural Classification for Census Blocks

Census 2010 block population data included an urban/rural classification variable ('URBRURALA'), which indicated if a block was considered to be urban or rural. The 2000–2010 cross-walk file from NHGIS was used to determine if a 2000 block was urban or rural in 2010 geography (Manson et al. 2019). In completing the cross-walk, two new population variables were created to yield the total urban and total rural population within a block. Logic statements were used to classify the block as either urban or rural, as follows: (1) if the total urban population within the block exceeded the total rural population, then the block was coded as urban in 2000; (2) if the total rural population within the block exceeded the total urban population, then the block was coded as rural in 2000; and (3) if there was a ‘0’ population value for both the urban and rural variables, the distance variable was used to provide a urban or rural classification. If the distance of the block to an existing UA or UC was 0 miles, then the block was coded as urban; if the distance was greater than 0, then the block was coded as rural.

The 2000 data were used in the calibration binary logit model as the dependent variable. The 2010 data were used to measure the forecasting accuracy of these binary logit models and as input into the forecasting model (used to predict urban status in 2020).

3.3.7 Metropolitan Statistical Area (MSA) Growth

The Georgia urbanization model included the Atlanta and Savannah MSAs, which house the state’s fastest growing counties. This, in turn, improved the model’s explanatory power for urbanization for the blocks with the MSAs. We included an indicator variable equal to ‘1’ if the county was in the Atlanta MSA in 2010, ‘0’ otherwise. Similarly, we included an indicator variable equal to ‘1’ if the county was in the Savannah MSA in 2010, and ‘0’ otherwise. Because these are county-level measures, we used the same set of variables for both the calibration and forecasted models.

3.4 Step 4: Estimate Binary Logit Models

To predict whether a block would be urban or rural in 2020, we used binary logit models, which are mathematically equivalent to logistic logit models, to estimate the probability a block will be urban in 2010. Formally, we define:

$$\begin{cases} Y_b = 1, \ If \ block \ b \ is \ urban \ in \ 2010 \\ Y_b = 0, \ If \ block \ b \ is \ rural \ in \ 2010 \end{cases}$$

We use a binary logit to model to predict whether a block is urban or rural in 2010. The binary logit models a choice among *J=2* alternatives where we define alternative 1 to be urban and alternative 2 to be rural. The utility obtained from alternative $i \in J$ is U_{bi}, which is decomposed as $V_{bi} + \varepsilon_{bi}$ where V_{bi} is defined as the representative utility and ε_{bi} is defined as an error term. Further, we may assume that $V_{b2} = 0$ (or that the utility for the rural alternative is zero) since utilities are nominal. That is, for identification purposes it is necessary to set the utility of an alternative to a constant. Then, the probability of choosing alternative i can be represented as a binary logit model where the difference in ε's is logistic:

$$P_{bi} = \frac{e^{V_{bi}}}{1+e^{V_{bi}}}$$

3.4.1 Step 4A: Estimate Binary Logit Models for Each State

We estimated a binary logit model for each state using the following utility equations:

$$
\begin{aligned}
V_{b1} = \alpha_1 + \beta_1&[\text{UC or UA in 2000}] \\
&+ \beta_2[\text{Closest urban is an urbanized area in 2000}] + \\
&\beta_3[\text{Rural and (0,1] miles from UA in 2000}] + \\
&\beta_4[\text{Rural and (1,2] miles from UA in 2000}] + \\
&\beta_5[\text{Rural and (2,3] miles from UA in 2000}] + \\
&\beta_6[\text{Log of distance to road in 2010}] + \\
&\beta_7[\text{Log of number of jobs in tract in 2010}] + \\
&\beta_8[\text{population density (500,1000] in 2010}] + \\
&\beta_9[\text{population density (1000,1500] in 2010}] + \\
&\beta_{10}[\text{population density (1500,2000] in 2010}] + \\
&\beta_{11}[\text{population density (2000,4000] in 2010}] + \\
&\beta_{12}[\text{population density of 4000 or more in 2010}] \\
V_{b2} = 0 \qquad &\qquad (3)
\end{aligned}
$$

The models were estimated for each state using the variables described above to predict if a block was urban or rural in 2010 (a known variable from the 2010 decennial census). Each of the state models was fitted to accurately predict the urban 2010 variable. Accuracy for all models was 90% or greater (see Appendix A for model accuracies by state). After obtaining accuracy for each of the models, the urban 2020 variable was predicted using a combination of 2010 and forecasted 2020 variables. We developed a set of urbanization scenarios, described in Section 3.5, based on whether the probability a block would be urban in 2020 was at least 50% or at least 75%.

The binary logit models were tailored to each state to ensure that the coefficients were monotonically increasing or decreasing (e.g., we would expect that the probability of urbanization would decrease as you move further outside of an urban area). In addition, for the state of Georgia, we ran an additional binary logit model that included two additional variables for whether a block as of 2010 was in the Atlanta MSA or the Savannah MSA. We used the 'glm' and 'predict' functions included in the 'stats' package in R Studio for this part of the analysis (R Core Team 2018). To evaluate the accuracy of each state's binary logit models, several statistics were generated (see Appendix A):

1. The results from each binary logit model (coefficients, t-statistics). The 'jtools' package was used to produce the model summary statistics (Long 2018).
2. The model fit, including the pseudo *R*-squared (R^2) value. The pseudo R^2 value can be interpreted as explaining the amount of variation in the data explained by the value (UCLA 2011).
3. The accuracy of the model which was produced using the 'caret' package in R. (Kuhn et al. 2018).

After we had run the 2010 binary logit models and confirmed that the models were accurately predicting urbanization for 2010, we input the 2020 datasets by state into the binary logit models to produce a probability variable for each block. The probability value assigned to the block indicates how likely the block is to be urban in 2020. These values were used to create urbanization scenarios, described in step 5.

3.4.2 *Step 4B: Estimate More Refined Binary Logit Models for Georgia*

Given the particular interest in identifying trending-urban implications for Georgia, we estimated other models for this state to incorporate additional information, particularly whether the block was part of the Atlanta MSA or the Savannah MSA in 2010. This updated utility function is shown below.

$$V_{b1} = \alpha_1 + \beta_1[\text{UC or UA in 2000}]$$
$$+ \beta_2[\text{Closest urban is an urbanized area in 2000}]$$
$$+ \beta_3[\text{Rural and (0,1] miles from UA in 2000}]$$
$$+ \beta_4[\text{Rural and (1,2] miles from UA in 2000}]$$
$$+ \beta_5[\text{Rural and (2,3] miles from UA in 2000}]$$
$$+ \beta_6[\text{Log of distance to road in 2010}]$$
$$+ \beta_7[\text{Log of number of jobs in tract in 2010}]$$
$$+ \beta_8[\text{population density (500,1000] in 2010}]$$
$$+ \beta_9[\text{population density (1000,1500] in 2010}]$$
$$+ \beta_{10}[\text{population density (1500,2000] in 2010}]$$
$$+ \beta_{11}[\text{population density (2000,4000] in 2010}]$$
$$+ \beta_{12}[\text{population density of 4000 or more in 2010}]$$
$$+ \beta_{13}[\text{part of Atlanta MSA in 2010}] + \beta_{14}[\text{part of Savannah MSA in 2010}]$$

$$V_{b2} = 0 \tag{4}$$

As a robustness check for Georgia, we estimated the model described above based on all blocks (defined as the global model) and rural-only blocks (defined as the rural-only model). The first global model included all blocks in our study area (except for water blocks and blocks associated with large protected areas in rural communities). A total of 366,846 blocks were included in the global model, of which we excluded 704 due to missing values within our data. Because urban blocks were arguably more likely to remain urban between the 2000 and 2010 c, we estimated a second model that included just the 171,635 blocks that were rural in 2000 and located within 10 miles of an urban border. The second model provided a better assessment of the prediction accuracy, since the larger model gives credit for accurately predicting urban blocks that stay urban.

3.5 Step 5: Predict Urbanization Scenarios

We used the results of the binary logit analysis to predict land use changes in 2020. There were slight differences in how we did this for the statewide models and Georgia-specific models. Fundamentally, we were able to do visual checks on the Georgia model, whereas we needed to use a more automated process for the state models. These processes are described below.

3.5.1 Step 5A.1: Predict Urbanization Scenarios for Each State

Four urbanization scenarios for each state were created using the probability variables from the binary logit output and distances to surrounding UAs and UCs generated by the Near Analysis completed in ArcMap. The criteria for each scenario are described below:

Merge **IF**:

1. The probability of the block being urban in 2020 is 50% or greater **AND**

A. Is classified as UC in 2010 **AND** within ½ mile of a 2010 UC or UA (Scenario 1A); **OR**

B. Is classified as UC in 2010 **AND** within 0 miles (contiguous) of a 2010 UC or UA (Scenario 1B); **OR**

2. The probability of the block being urban in 2020 is 75% or **AND**

A. Is classified as a UC in 2010 **AND** is within ½ mile of a 2010 UC or UA (Scenario 2A); **OR**

B. Is classified as a UC in 2010 **AND** is within 0 miles (contiguous) of a 2010 UC or UA (Scenario 2B).

To identify the nearest UA or UC, the 2020 binary logit model outputs were aggregated by their respective U.S. Census Bureau division (west, south, midwest, and northeast) and brought into ArcMap to conduct another Near Analysis, this time to obtain the distances between the UCs and UAs (these are the distances used to create each of the scenarios described above). The first step in the Near Analysis was to dissolve boundaries by the nearest UC/UA to assign blocks predicted to be urban to their closest UA or UC. Then, isolated slivers of a UC/UA were removed to prevent false merging. This could occur if an isolated portion of a UC/UA were contiguous to another UC/UA but the remainder of the UC/UA to which the isolate belongs may not be contiguous. These isolates were removed by selecting for shape areas greater than ½ square mile. The maximum number of closest matches was set to 3, which yielded the three closest UCs/UAs to the input UC/UA, ranking each by its proximity. The output from this analysis was then brought back into R to generate the scenarios.

3.5.2 Step 5A.2: Identify Whether a UC Will Grow into a UA or Merge with Another UA in Each State

In 2010, a total of 3,573 UCs and UAs existed in the U.S. (excluding Puerto Rico and the Island Areas). Each of the scenarios yielded a fewer number of UCs and UAs, meaning UCs/UAs had been absorbed by other UCs/UAs. Using the distances generated from the Near Analysis, each of the four merger scenarios (1A–2B) was created. For example, under Scenario 1A (50% and within ½ mile), the Arlington, TN UC is predicted to merge with the Memphis, TN–MS–AR UA. There were some instances in which a UC/UA was contiguous (within 0 miles) to more than one UC/UA. In this situation, the input UC/UA was assigned to merge with the contiguous UC/UA that had the highest population.

3.5.3 Step 5B: Predicting Urbanization Scenarios and UC Growth and Mergers for Georgia

The process used for the national-level state model was repeated using the more refined Georgia global model. However, in addition to the automatic process described above, we visually inspected results to ensure that the UC mergers made intuitive sense. There were a few places near Atlanta where we "overrode" the automated process to assign blocks that were part of a UC to a more logical UA. For example, Carrolton, GA, was not assigned to the Atlanta urban area but as its own small urban area, as it was connected to Atlanta via a handful of blocks and the main growth in Carrolton was outside this "sliver" that connected the two. In other instances, we found mergers to be improbable based on an inspection of current land use patterns, and recoded those areas as non-urbanized (e.g., Jasper, GA). Finally, in some instances, we found mergers to be probable, such as in Jackson, GA, and coded it as part of the Atlanta area in the 50% model.

3.6 Step 6: Calculate New Urbanized and Non-Urbanized Population and Land Area

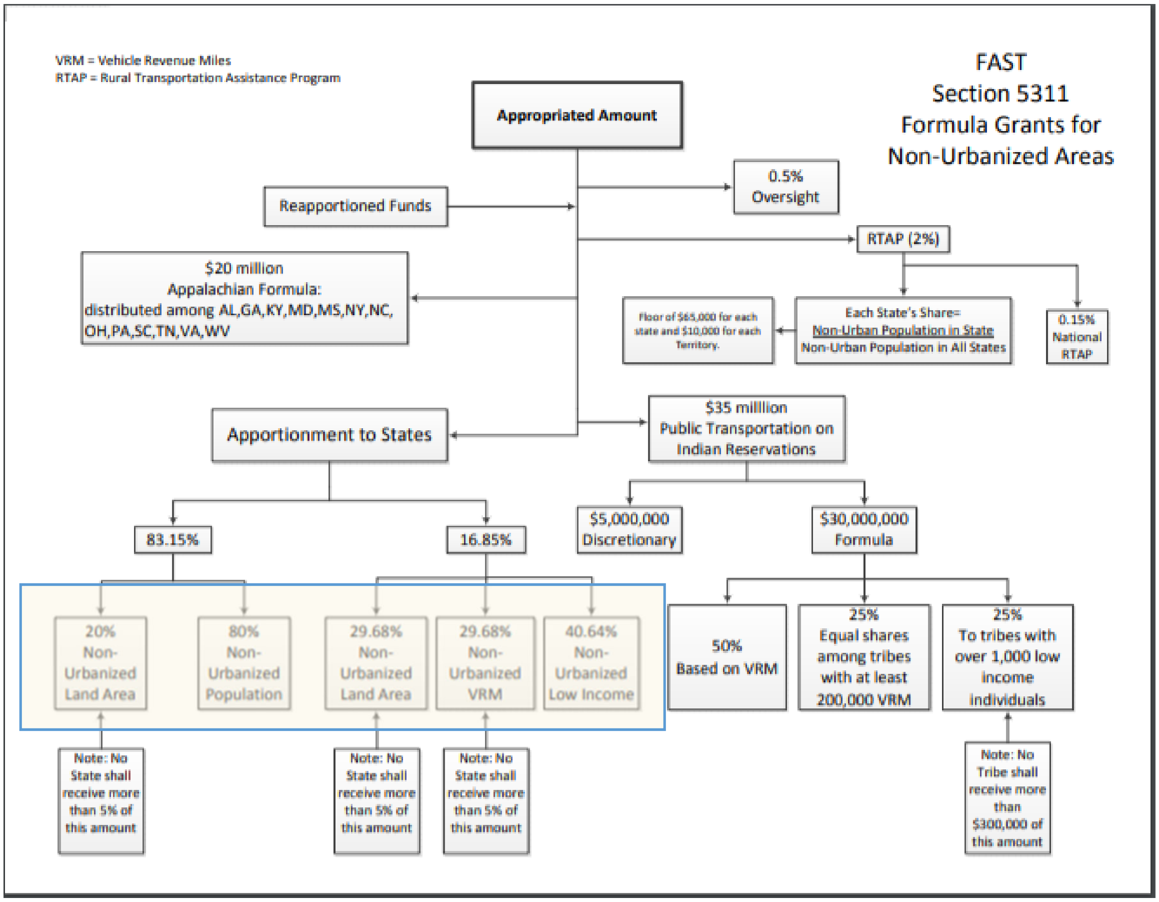
Given an urbanization scenario, it is straightforward to calculate the new urbanized and non-urbanized population and land areas. At the state level, the urbanized and non-urbanized population and land areas are used as inputs for the FTA § 5311 and § 5307 funding formulas. However, to calculate funding gaps for individual transit operators in Georgia, these calculations need to be performed at the county level. This is the distinction in Steps 6A and 6B shown in Figure 4.

The population and land area for each UC/UA was summed and assigned as non-urbanized if the population was less than 50,000; small urban if the population was between 50,000 and 200,000; and large urban if the population was greater than 200,000. Those areas assigned as small urban or large urban were then classified as UAs in each scenario.

These scenario population and land area sums and classifications were joined back to the original 2020 block file containing population and land area. Then, the projected population and land area were summed at both the state and county levels for each scenario. This yielded a new urbanized population and land area for each of the scenarios. The percentages of urbanized and non-urbanized population and land area under each scenario were then compared to the 2010 percentages of urbanized and non-urbanized population and land area at both the county and state levels. The tables containing the percent changes for population and land area are included in Appendix C (see Table C1).

3.7 Step 7: Obtain Other Variables Used for FTA § 5311 and § 5307 Formulas

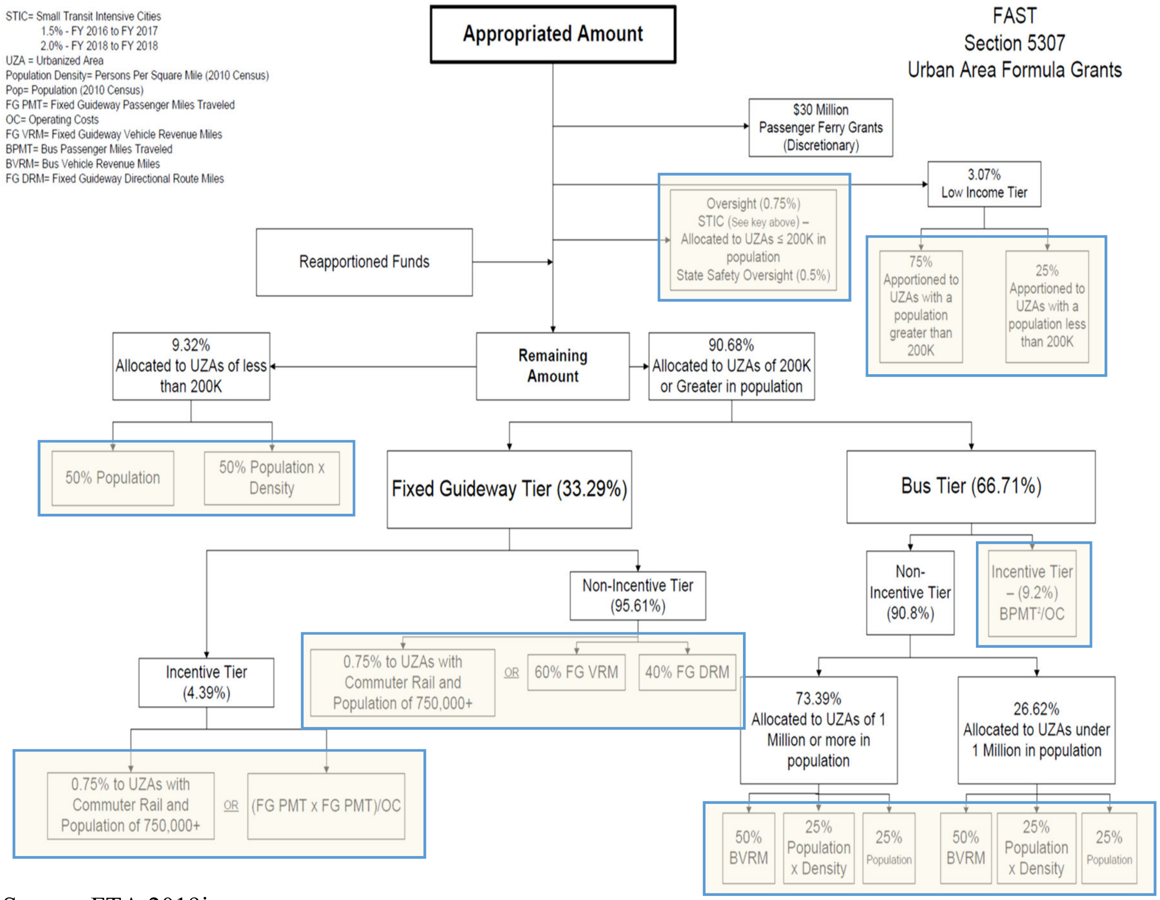
To predict the FTA § 5311 and § 5307 appropriations after the 2020 decennial census, we needed to apply the funding formulas for each respective program, shown in Figure 5 and Figure 6. For the FTA § 5311 program, we produced forecasts for the shaded boxes at the bottom right of Figure 5 using outputs from our state-specific binary logit models, the NTD, and other tables. We used a similar process in Figure 6 to predict the FTA § 5307 appropriations. The inputs we used for each shaded box are shown in Table 3, and the specific tables we used are shown in Table 4 (along with references that contain their online links). We used the most recent data available that corresponded to the FY19 appropriations; thus, FY17 NTD data were used for the FY19 appropriations.



Source: FTA 2019h.

FIGURE 5

§ 5311 Formula Grant



Source: FTA 2019i.

FIGURE 6

§ 5307 Formula Grant

TABLE 3

Variables Used to Predict § 5311 and § 5307 Appropriations

Urbanized Status	Funding Sub-Category	Variable	Data Source
Urbanized Areas Over 200,000 (Note: LU over 1,000,000 are calculated with the same data but different unit values)	5307 LU Bus Tier	Population	State-specific binary logit models
		Population × Density	
		Bus Revenue Vehicle Miles	FTA Table
	5307 LU Bus Incentive	(Bus Passenger Miles)^2 / Operating Costs	FTA Table
	5307 LU Fixed Guideway Tier	Fixed Guideway Revenue Vehicle Miles	FTA Table
		Fixed Guideway Route Miles	
		Commuter Rail Floor (binary)	
	5307 LU Fixed Guideway Incentive	(Fixed Guideway Passenger Miles × Fixed Guideway Passenger Miles) / Operating Costs	FTA Table
		Commuter Rail Incentive Floor (binary)	
	5307 LU Low-Income	Low-income	FTA Table
Urbanized Areas Over 50,000 and under 200,000	5307 SU	Population	State-specific binary logit models
		Population × Density	
	5307 SU Low-Income	Low-income	FTA Table
	5307 STIC	STIC Factors / Qualifying Performance Category	FTA Table
Non-Urbanized Areas	Based on Land Area and Population	Population	State-specific binary logit models
		Land Area	
	Based on Land Area, Vehicle Revenue Miles, and Low-income Individuals	Land Area	State-specific binary logit models
		Vehicle Revenue Miles	FTA Table
		Low-income	FTA Table

LU= large urban and SU=small urban

TABLE 4

FTA Tables Used to Predict § 5311 and § 5307 Appropriations

Reference	FTA Source Tables	Application for National and Georgia Models*
2019a	Census Data on Rural Population and Land Area (used for the Section 5311 Rural Area Formula apportionments)	Substituted by binary logit model predictions for 50% ½-mile scenario and 75%, 0-mile scenarios.
2019b	Census Low Income Population Data (used for the Section 5307 and 5311 apportionments)	Kept static for calculations.
2019c	Census Urbanized Area Population and Population Density Data (used for Section 5303, 5305, and 5307 apportionments)	Substituted by binary logit model predictions for 50% ½-mile scenario and 75%, 0-mile scenarios.
2019d	National Transit Database Data Used for the Section 5307 Urbanized Area Formula and Section 5339 Bus Formula Apportionments	*Modified by adding future rural miles that will be in urbanized area using the percentage of the county that shifted to urbanized in terms of population.
2019e	National Transit Database Data Used for the Section 5311 Apportionments	*Modified by subtracting future rural miles that will be urbanized using the percentage of the county that shifted to urbanized in terms of population.
2019f	National Transit Database Data Used for the STIC Apportionments	Used to attribute STIC funding based on 2019 values.
2019g	National Transit Database and Census Data Used for the Tribal Transit Apportionments	Kept static for calculations.
2019j	Table 3A. Section 5307 Operating Assistance Special Rule Operator Caps	*Amount apportioned to Large Urbanized Areas used for “operating expense gap calculations,” along with vehicle revenue hours attributed to counties in the UA.
2019k	Table 5: FY 2019 Formula Apportionments Data Unit Values (Full Year)	Used to translate each input (e.g., population) into a dollar amount.

* Modifications to input NTD data for Georgia are shown with a *. Note Table 3A is only used for the Georgia-specific gap calculations.

3.8 Step 8: Predict Funding

3.8.1 Step 8A: Predict, by State, § 5311 and § 5307 Appropriations after 2020 Census

Given the inputs for the formula funding, we can predict, by state, the § 5311 and § 5307 appropriations after the 2020 census. To describe this process, we present two examples: one for the § 5311 appropriation and the other for the § 5307 appropriation.

Example 1: § 5311 Appropriation for Georgia after the 2020 Census

As shown in Figure 5, there are four inputs that we used to predict the § 5311 appropriation (shown in the shaded parts of the figure). These are summarized in Table 5 and include the non-urbanized land area, non-urbanized population, non-urbanized VRM and non-urbanized low-income population. We obtained estimates of the 2020 non-urbanized land area and population using the state-specific binary logit model that we estimated; these include an "aggressive" forecast (based on the 50% probability, ½ mile model) and a "conservative" forecast (based on the 75% probability, 0 mile model). We assumed that the non-urbanized VRMs will remain the same after 2020; this may not be the case for those rural areas that transition to a small urban area or get absorbed into a large urban area, but for the purposes of determining a range of potential § 5311 funding at the state level after 2020, this effect will be small. We also excluded the VRM from tribes from the analysis. Finally, we used "FTA Table 5" to convert each of these inputs into a dollar amount (these are shown in Table 6).

TABLE 5

Example § 5311 Appropriation Calculation for the State of Georgia

Variable	Source	Aggressive Estimate (50%, ½ mile model)	Conservative Estimate (75%, 0 mile model)
2020 Non-urbanized land area	GA binary logit model	42,292	42,765
2020 Non-urbanized population	GA binary logit model	2,444,276	2,501,056
2020 Non-urbanized low income	GA binary logit model	946,226	985,205
FY18 Non-urbanized VRM	National Transit Database Data Used for the Section 5311 Apportionments	16,340,485	16,340,485

TABLE 6

FTA Values Used for § 5311 Appropriation (FY19)

Appropriation Formula Piece	Data Value
Based on Land Area and Population	
Population	4.720
Land Area	30.53
Based on Land Area, Vehicle Revenue Miles, and Low-Income Population	
Land Area	9.18
Vehicle Revenue Mile	0.054
Low-Income	1.915

Using the inputs shown in Table 5 and Table 6, we calculated the 2020 FTA § 5311 appropriation for Georgia as follows (assume 50%, ½ mile forecast is used):

2020 § 5311 Appropriation =

$$4.72 \times (\text{2020 non-urbanized population}) + 30.53 \times (\text{2020 non-urbanized land area})$$
$$+ 9.18 \times (\text{2020 non-urbanized land area}) + 0.054 \times (\text{2020 non-urbanized VRM})$$
$$+ 1.915 \times (\text{2020 low-income})$$

$$\text{2020 § 5311 Appropriation} = 4.72 \times (2{,}444{,}276) + 30.53 \times (42{,}292) + 9.18 \times (42{,}292) + 0.054 \times (16{,}340{,}485) + 1.915 \times (946{,}226) = 15{,}910{,}807$$

Example 2: § 5307 Appropriation for Georgia after the 2020 Census

As shown in Figure 6, there are multiple inputs that we used to predict the § 5307 appropriation (shown in the shaded parts of the figure). These are summarized in Table 7 and include the urban populations and urban population densities associated with: (1) small urban areas with populations of 50K–200K; and (2) large urban areas of populations greater than 200K. We obtained estimates of the 2020 population and population densities for small and large urban areas using the state-specific binary logit model that we estimated; these include an aggressive forecast (based on the 50% probability, ½ mile model) and a conservative forecast (based on the 75% probability, 0 mile model). We obtained estimates of the service characteristics reported to the NTD. These service characteristics include: fixed guideway passenger miles travelled, fixed guideway vehicle revenue miles, fixed guideway directional route miles, bus revenue vehicle miles, and operating costs. We assumed the service characteristics as of FY17 (the most recent data available/used for FY19 appropriations) will be the same after 2020. As noted earlier, this may not be the case for those rural areas that transition to a small urban area or are absorbed into a large urban area, but for the purposes of determining a range of potential § 5311 funding at the state level after 2020, this effect will be small. We excluded tribal service characteristics from the analysis. We assumed that the amount of STIC funding the state received in the most previous year will continue in the future. Finally, we used FTA Table 5 to convert each of these inputs into a dollar amount (these are shown in Table 8).

TABLE 7

Inputs for the § 5307 Appropriation Calculation for the State of Georgia

Variable	Source	Aggressive Estimate (50%, ½ mile model)	Conservative Estimate (75%, 0 mile model)
2020 Population for Areas 1M+	GA binary logit model	5,347,854	5,194,605
2020 Population for Areas <1M	GA binary logit model	963,793	923,404
2020 Population for Areas 50K–200K	GA binary logit model	1,202,540	1,101,036
2020 Population Density for Areas 1M+	GA binary logit model	1,485	1,799
2020 Population Density for Areas <1M	GA binary logit model	1,359	1,652
2020 Population Density for Areas 50K–200K	GA binary logit model	925	1,249
2020 Low Income Population for Areas 50K–200K	(2019b)	367,383	338,647
2020 Low Income Population for Areas 200K+	(2019b)	1,403,328	1,363,766
FY17 Bus VRM for Areas 1M+	(2019d)	47,335,932	46,833,207
FY17 Bus VRM for Areas <1M	(2019d)	7,175,086	6,963,124
FY17 Bus Pax Miles for Areas 1M+	(2019d)	357,733,553	357,230,828
FY17 Bus Pax Miles for Areas <1M	(2019d)	17,118,846	16,906,884
FY17 Fixed Guideway Pax Miles for Areas 1M+	(2019d)	469,323,071	469,323,071
FY17 Fixed Guideway Pax Miles for Areas <1M	(2019d)	256,504	256,504
FY17 Fixed Guideway VRM for Areas 1M+	(2019d)	22,405,959	22,405,959
FY17 Fixed Guideway VRM for Areas <1M	(2019d)	15,550	15,550
FY17 Fixed Guideway Directional Route Miles for Areas 1M+	(2019d)	100.4	100.4
FY17 Fixed Guideway Directional Route Miles for Areas <1M	(2019d)	1.4	1.4
FG Operating Costs for Areas 1M+	(2019d)	196,339,074	196,339,074
FG Operating Costs for Areas <1M	(2019d)	875,235	875,235
Bus Operating Costs for Areas 1M+	(2019d)	310,820,674	309,716,092
Bus Operating Costs for Areas <1M	(2019d)	28,148,985	27,681,785
State-wide STIC points	(2019f)	15	15

TABLE 8

FTA Values Used for § 5307 Appropriation (FY19)

Appropriation Formula Piece	Data Value
Bus Tier for Urbanized Areas Above 1M	
Population	3.346
Population × Density	0.0008918
Bus Revenue Vehicle Miles	0.4301
Bus Tier for Urbanized Areas Under 1M	
Population	2.884
Population × Density	0.001311
Bus Revenue Vehicle Miles	0.5354
Bus Incentive (PM Denotes Passenger Miles)	
$(\text{Bus PM})^2$ / Operating Cost	0.01402
Fixed Guideway Tier	
Fixed Guideway Revenue Vehicle Miles	0.6248
Fixed Guideway Route Miles	38,861
Commuter Rail Floor	9,748,729
Fixed Guideway Incentive	
$(\text{Fixed Guideway OM})^2$/Operating Cost	0.0008806
Commuter Rail Incentive Floor	447,620
Low Income Individuals for Areas Under 200K	
Low-income	2.353
Low Income Individuals for Areas Over 200K	
Low-income	4.231
Urbanized Area Formula Program for Areas Under 200K	
Population	6.775
Population × Density	0.003442
Small Transit Incentive Cities	
For Each Qualifying Performance Category	261,911

Using the inputs shown in Table 7 and Table 8, we calculated the 2020 FTA § 5307 appropriation for Georgia as follows (assume 50%, ½ mile forecast is used). This is a simplification of our process, as in our actual calculations we used UA-specific values for population densities and accounted for UAs that crossed state boundaries. As such, the value below is not the actual § 5307 that Georgia receives but is meant to demonstrate the application of the funding formula.

2020 § 5307 Appropriation =

3.346 × (2020 Population in LU 1M+)

+ 0.0008918 × (2020 Population in LU 1M+ × 2020 Population Density in LU 1M+)

+ 0.4301 × (Adjusted FY17 Bus VRM in LU 1M+)

+ 2.884 × (2020 Population in Areas <1M)

+ 0.001311 × (2020 Population < 1M × 2020 Population Density <1M)

+ 0.5354 × (Adjusted FY17 Bus VRM in areas <1M)

+ 0.01402 × (FY17 Bus Passenger Miles)^2 / (FY17 Bus Operating Costs)

+ 0.6248 × (FY17 Fixed Guideway VRM)

+ min { 9,748,729 or 38,861 × (FY17 Fixed Guideway Route Miles)}

+ min { 447,620 or 0.0008806 × (FY17 Fixed Guideway Passenger Miles)^2} / (FY17 Fixed Guideway Operating Costs)

+ 2.353 × (FY17 Low-income for Areas 50K–200K)

+ 4.231 × (FY17 Low-income for Areas 200K+)

+ 6.775 × (2020 Population in Areas 50K–200K)

+ 0.003442 × (2020 Population in Areas 50K–200K) × (2020 Population Density in Areas 50K–200K)

+ 261,911 × (FY17 STIC Qualifying Criteria Met)

2020 § 5307 Appropriation =

3.346 × (5,347,854)

+ 0.0008918 × (5,347,854 × 1,485)

+ 0.4301 × (47,335,932)

+ 2.884 × (963,793)

+ 0.001311 × (963,793 × 1,359)

+ 0.5354 × (7,175,086)

+ 0.01402 × (357,733,553+17,118,846)^2 / (310,820,674+28,148,985)

+ 0.6248 × (22,405,959 +15,550)

+ min { 9,748,729 or 38,861 × (100.4+1.4)}

+ min {447,620 or 0.0008806 × (469,323,071+256,504)^2} / (196,339,074+875,235)

$+ 2.353 \times (367{,}383)$

$+ 4.231 \times (1{,}403{,}328)$

$+ 6.775 \times (1{,}202{,}540)$

$+ 0.003442 \times (1{,}202{,}540) \times 925$

$+ 261{,}911 \times (15)$

$= \$100{,}604{,}554$

Note: this example calculation differs from the actual calculations performed, which based the inputs on UA data. This calculation also does not include the FTA § 5340 growing states portion, which for urban areas is approximately 4% (thus our total “5307” estimate for Georgia would be approximately $104.6M).

3.8.2 Step 8B: Predict, by County in Georgia, § 5311 and § 5307 Funding Levels After the 2020 Decennial Census and Funding Gaps for High Risk Transitions

We replicated the analysis above for the state of Georgia and calculated the projected § 5311 and § 5307 levels for each county. To compare against the existing funding levels for each county, we had to include the FTA § 5340 growing states component in the Georgia analysis. Thus, the analysis is identical to that in Step 8A but includes an additional piece to represent the FTA § 5340 funding for growing states.

3.8.3 Summary

For the national model predictions described in Step 8A, we only included population and urbanized status changes when calculating the predicted funding levels for § 5311 and § 5307 funding because of the difficulty of linking providers to geographical areas at the national level. That is, there is no national database linking counties to rural providers. However, we have this information for the state of Georgia and, as such, could calculate county-level estimates of future FTA § 5311 and § 5307 funding. In addition, we could conduct a more detailed analysis of funding gaps that will likely occur after the 2020 decennial census if current transit systems operating in rural areas are absorbed into large urban areas. To do the latter, we adjusted the most recent NTD service data and "shifted" the service amounts currently in rural areas that we expect to be part of urban areas after 2020. These "Georgia-specific" methodology applications are shown in Table 3 (see p. 37).

The calculations used to predict funding levels for § 5311 and § 5307 after the 2020 decennial census were identical to those used for the national level, with one key difference: we needed to use county-level data (versus state-level data) as inputs. To do this, we needed to: (1) associate providers with individual counties; and (2) make assumptions as to when a county will offer § 5311 and/or § 5307 service.

With respect to the first assumption, in Georgia, the majority of service providers serve residents in a single county. For these providers, there is a one-to-one correspondence between the service provider and county. However, there are also several multi-county providers in Georgia. For these providers, we allocated the total service characteristics using one of two methods. For some providers, we knew the actual vehicles that were being used/had been assigned to individual counties, and could directly calculate the county-level service characteristics using these individual vehicles. For other providers, we only knew the total service characteristics across all of the counties in the service area. For these providers, we allocated the total service characteristics to individual counties proportional to the rural population in each of these counties. With respect to the second assumption, we assumed that it is feasible for a county to start providing § 5307 service if at least 20% of its population is within an urbanized area.

The final step in the analysis was to calculate "funding gaps" associated with those counties trending urban in Georgia. A major challenge for areas transitioning from § 5311 service to § 5307 service is that FTA limits the amount of § 5307 funding that can be used to support operating expenses. For most transit systems, no § 5307 funding can be used toward operating expenses. However, there is an exception for small systems with fewer than 100 buses operating in urban areas, which is colloquially referred to as the "100 bus rule." This rule applies a cap on the amount of § 5307 funding that can be used toward operating. For those systems that operate fewer than 75 buses, up to 70% of an operator's percentage of the UA's vehicle revenue hours can be applied toward operating expenses. For those systems that operate between 76 and 100 buses, up to 50% of the operator's percentage of the UA's vehicle revenue hours can be applied toward operating.

We define the group of operators that would be most affected by urbanization and the 100 bus rule as "high-risk counties" that currently have exclusively rural service but are predicted to have at least 20% of their populations classified as large urban after the 2020 decennial census. These counties would face a two-year lag on § 5307 funding related to NTD apportionment data, because the NTD data used are from two years prior to the fiscal year of the apportionments and the 100 bus rule is based on § 5307 operating characteristics. To calculate the funding gap for these high-risk counties, we take the differences between the § 5311 funding appropriations for FY19 and FY20.

3.9 Summary

This chapter provided a detailed description of the data and methodology used in the analysis. The next chapter presents the key results from the analysis.

4 RESULTS

This chapter discusses the results, which are organized by whether they are used to determine Georgia-specific or national-level trends and funding implications. The Georgia results that do not rely on national calculations are discussed in Section 4.1 and include the binary logit results, identification of areas in Georgia that are trending urban and at risk for losing § 5311 funding, and implications on transit funding for individual transit operators, respectively. National-level results are discussed in Section 4.2 and include the state-specific binary logit results, identification of areas in the nation that are trending urban and are at risk for losing § 5311 funding, predictions of state-level § 5311 appropriations, and predictions of § 5307 appropriations after the 2020 decennial census, respectively. Finally, in Section 4.3, the Georgia results that are derived from the national-level predictions of the § 5311 and § 5307 analysis are discussed. This includes a summary of Georgia's outlook on future § 5311 and § 5307 funding and insights gleaned from examining § 5311 and § 5307 appropriations at the county level in Georgia.

4.1 Results for Georgia

4.1.1 Georgia Binary Logit Model Results

The results of the Georgia binary logit model are shown in Table 9. These include the global model (that contains all blocks) and the rural model (that contains only those blocks that were rural in 2000). The number of U.S. Census Bureau–defined urban blocks increased by 14% between 2000 and 2010 in Georgia, and our final model accurately predicts the results of rural-to-urban changes in Georgia between 2000 and 2010 with the accuracy at 94% for the global model and 92% for the rural model. Our model shows that the strongest predictor variables for rural-to-urban conversion were in proximity to an existing urban border and population density. Specifically, "border blocks," which we define as those within a quarter mile of an existing urban border, increase the odds of rural-to-urban conversion by 25-fold, and even blocks up to 3 miles away from existing urban borders have significantly higher odds of conversion (see Table 9, column Exp(β)). The coefficients for our population density variables follow the U.S. Census Bureau guidelines, with blocks including more than 500 people per square mile having positive probabilities of conversion, and this trend extends with larger positive probabilities as densities increase. Furthermore, blocks within the fastest growing MSAs in the state (i.e., Atlanta and Savannah) also affect the odds of rural-to-urban conversion, as does a block being in a census tract with larger numbers of jobs. All other factors being equal, a location closer to primary and secondary roads also significantly increases the odds of urbanization, albeit with a relatively small effect on the odds of conversion. In sum, if a block is near existing roads, near existing urban area boundaries, has a population density over 500 people per square mile, and is in an area with more jobs, it has a high probability of urbanization.

TABLE 9

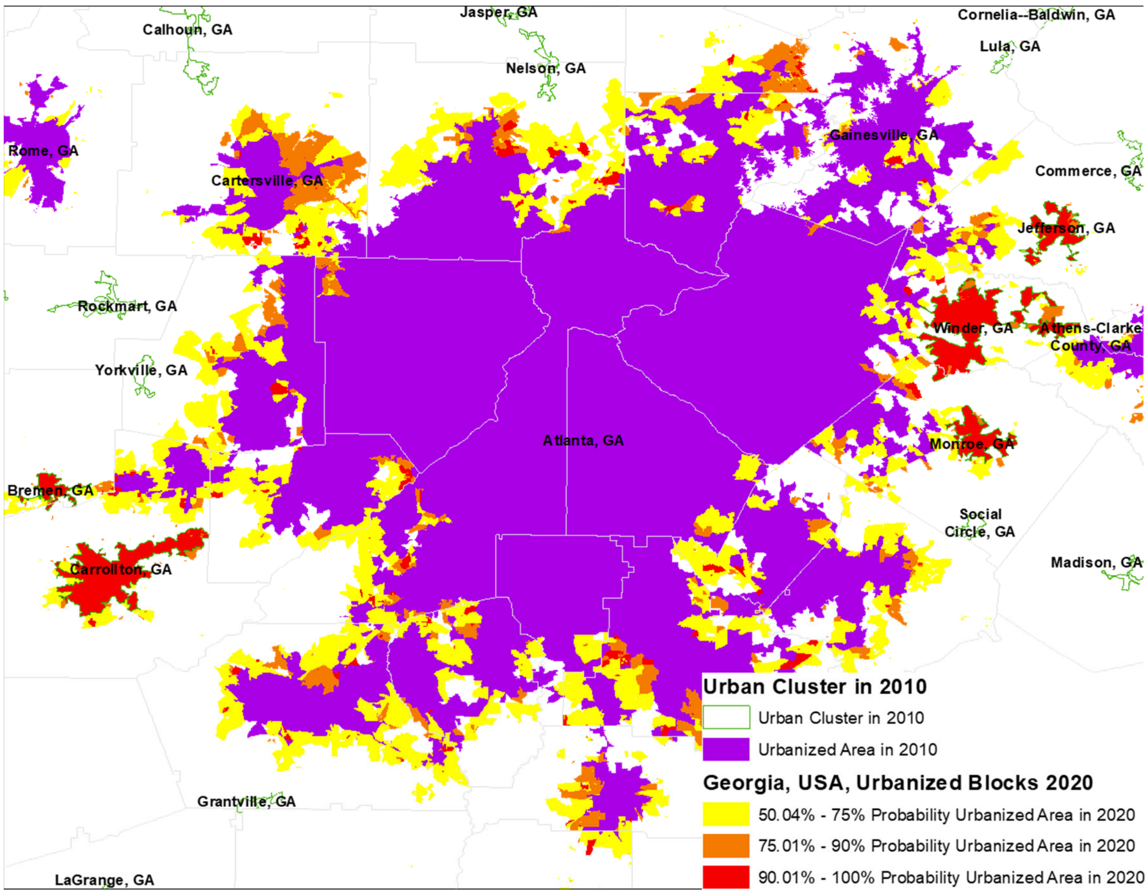
Binary Logit Model Results for Georgia

	Global Model[a]				Rural Model[b]			
	β	**S.E.**	**Exp(β)**	**Prob**	**β**	**S.E.**	**Exp(β)**	**Prob**
Urban (UC or UA in 2000)	6.11	0.03	448.20	1.00				
Closest urban is an urbanized area	1.12	0.02	3.05	0.75	1.10	0.02	3.00	0.75
In 2010 Atlanta MSA	0.95	0.02	2.59	0.72	0.94	0.02	2.57	0.72
In 2010 Savannah MSA	0.92	0.05	2.51	0.72	0.97	0.06	2.64	0.72
Urban area (reference)	—	—	—	—	—	—	—	—
Rural and (0,1] miles from UA	3.23	0.02	25.20	0.96	3.17	0.02	23.89	0.96
Rural and (1,2] miles from UA	1.39	0.03	4.00	0.80	1.36	0.03	3.89	0.80
Rural and (2,3] miles from UA	0.78	0.04	2.18	0.69	0.77	0.04	2.16	0.68
Log of distance to roads	−1.11	0.02	0.33	0.25	−1.13	0.03	0.32	0.24
Log of number of jobs in tract	0.45	0.01	1.57	0.61	0.52	0.01	1.69	0.63
2010 population density (0,500] PSQM (reference)	—	—	—	—	—	—	—	—
2010 population density (500,1000] PSQM	1.98	0.03	7.21	0.88	1.99	0.03	7.33	0.88
2010 population density (1000,1500] PSQM	2.14	0.04	8.49	0.89	2.13	0.04	8.45	0.89
2010 population density (1500,2000] PSQM	2.27	0.04	9.65	0.91	2.16	0.05	8.67	0.90
2010 population density (2000,4000] PSQM	2.69	0.03	14.74	0.94	2.59	0.04	13.38	0.93
2010 population density of 4000 or more PSQM	2.90	0.04	18.14	0.95	2.78	0.05	16.04	0.94
Constant	−7.12	0.06	0	0	−7.78	0.07	0	0

[a] Accuracy 94%; R^2 = 0.87; [b] Accuracy 92%; R^2 = 0.54
All variables significant at a 0.01 significance level.

4.1.2 Areas in Georgia that are Trending Urban

Our model identified several low-risk transitions that occur when a rural system grows into a small urban system. As shown in Figure 7, within the greater Atlanta area, Winder is expected to grow internally from a UC to a UA with at least a 0.75 probability, as is Carrollton with at least a 0.50 probability; these two areas may also merge with adjacent large UAs.



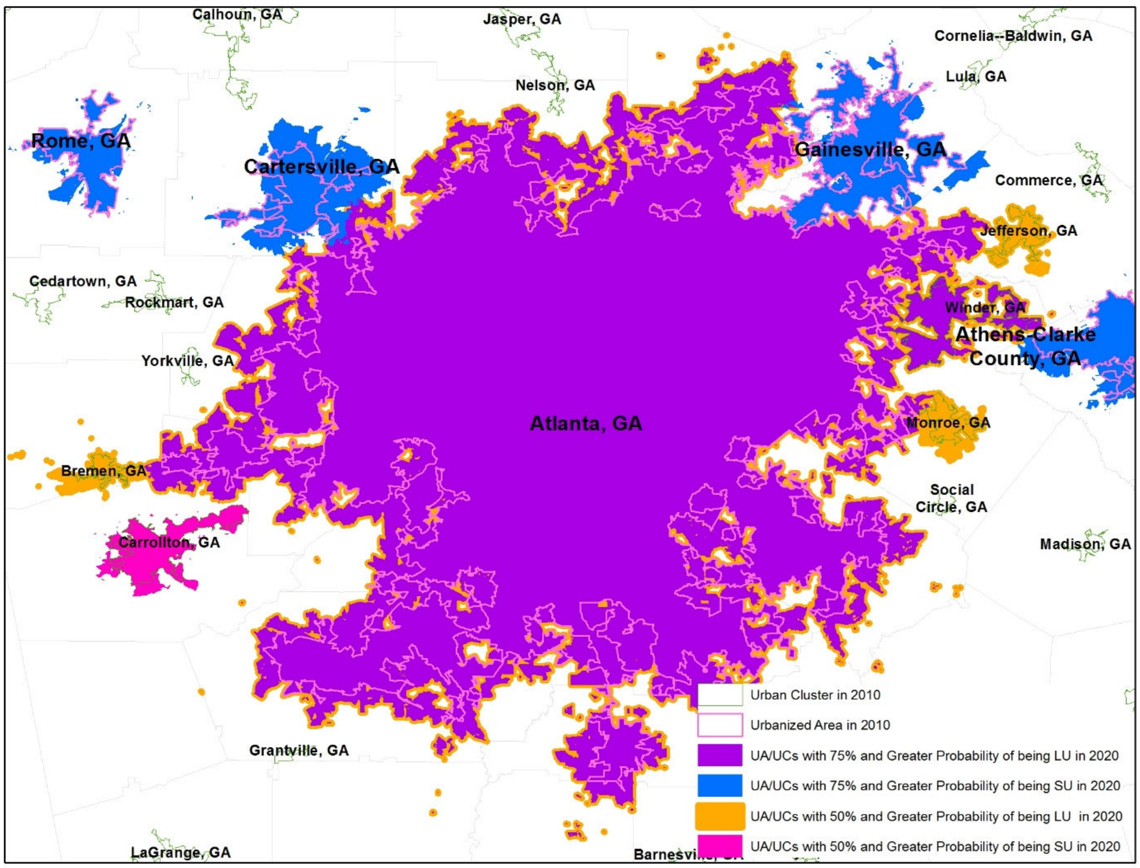
*Note: Green outlines are urban clusters in 2010 (U.S. Census Bureau 2017). Map prepared with ESRI ArcMap 10.5.

FIGURE 7

Probabilities of Urbanized Areas in Metro Atlanta 2020

Important changes will also occur through UCs being absorbed into larger UAs, with the assumption that if boundaries are touching, the urban areas will merge. Figure 8 illustrates the concept of urban areas merging and identifies the UAs and UCs that could potentially be absorbed into the Atlanta UA. If the UCs in Figure 8 (Winder, Monroe, Bremen, and

Jefferson) are absorbed into the Atlanta UA, they would transition directly from rural eligibility to large UA eligibility in terms of funding category. In fact, our model shows that in Georgia this merger-driven change (representing medium- and high-risk funding scenarios) is more common than population-driven shifts from rural to urban (representing low-risk funding scenarios). This is principally an issue in the Metro Atlanta region.



Source: U.S. Census Bureau 2017. Map prepared with ESRI ArcMap 10.5.

FIGURE 8

Urban Clusters and Urbanized Areas Expected to Merge with Atlanta After the 2020 Census

Although most urbanization in Georgia is occurring around Atlanta, the cities of Macon and Savannah are also projected to expand outward and could potentially merge with surrounding UCs and UAs (see Table 10). If Savannah merges with Rincon and Buckhead (the neighboring UCs) as our 0.50 model predicts, the total urbanized population would be such that Rincon and Buckhead would no longer be eligible for § 5311 operating assistance.

TABLE 10

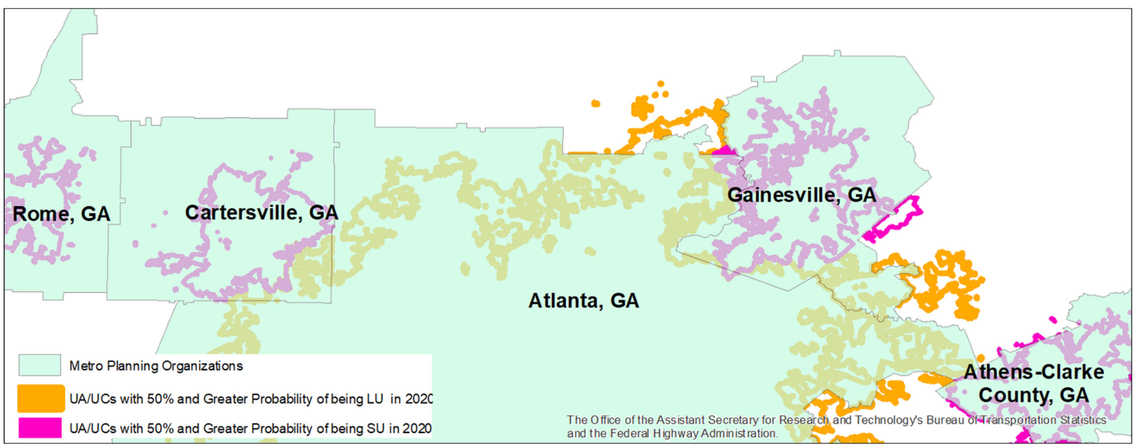
Predictions of Areas in Georgia That Will Need to Transition to New FTA Funding

Potential Mergers	2010 Urbanized Areas or Clusters at Risk for Merger	Alternate Scenarios
Macon–Warner Robins (LU)	Macon (SU) (Bibb County)** Warner Robins (SU) (Houston County, Peach County)**	UA grandfathering criteria prevents merger
Savannah (LU)	Rincon (UC) (Effingham County)** Buckhead (UC) (Bryan County)*	N/A
Atlanta Urbanized Area (LU)	Gainesville (SU) (Hall County)**	UA grandfathering criteria prevents merger
	Winder (UC) (Barrow County)**	Merges to (LU) with Athens–Clarke–Winder, GA, or Atlanta UA
	Bremen (UC) (Haralson County, Carroll County)*	N/A
	Jefferson (UC) (Jackson County)*	N/A
	Monroe (UC) (Walton County)*	N/A
Albany (SU)	Leesburg (UC) (Lee County)*	N/A

*Key: UC=urban cluster; SU=small urban area; LU=large urban area. Areas defined as urban clusters by U.S. Census Bureau are classified as rural by FTA and are eligible for § 5311 funding. Model predictions in the 50–74 probability range are denoted by * and those in the 75–89 probability range are denoted by **. LU presumed not to merge unless grandfathering rule is changed.

Further, as shown in Figure 9, growth in Atlanta is such that our model predicts that several existing UAs will also merge. For the 2010 decennial census, a set of "grandfathering" rules were used to keep distinct UAs (often located in distinct MPOs) from merging

(FTA 2015). We discussed this issue with a representative from the U.S. Census Bureau who noted that although "we have not begun to work on criteria for urbanized areas and urban cluster for the 2020 census,…at this time, we are not planning substantive changes to the criteria" (Ratcliffe, et al., 2016). Based on this expectation, we anticipate that Cartersville and Gainesville (which are not part of the Atlanta MPO) will remain separate small urban transit systems and not be absorbed into the large Atlanta UA. Ultimately, the grandfathering rules will help maintain operating transit funding in megaregions with growth expanding across multiple urban areas if one or more of these UAs can maintain a small urban designation.



Source: U.S. Census Bureau 2017. Map prepared with ESRI ArcMap 10.5.

FIGURE 9

Contiguous or Near-Contiguous MPOs and Urbanized Areas in Metro Atlanta After 2020 Census

4.1.3 Anticipated Funding Gaps in Georgia

The anticipated funding gaps for the high-risk counties that are trending urban and currently do not offer § 5307 operations is summarized in Table 11. These counties correspond to those shown as UCs on Table 10 that will potentially merge with an LU.

These counties will face a shortfall of $225K–$1.11M in years one and two after the decennial census. As noted earlier, these operators will be prevented from using FTA § 5307 funds for the first two years after the 2020 decennial census while they wait for their new § 5307 operations to become certified. Among the counties shown in Table 11, Barrow is the only one that appears in both the conservative and aggressive forecast. All of the other counties shown in Table 11 appear only on the aggressive (and therefore less likely) forecast.

TABLE 11

Operating Funding Gaps for Georgia Counties Trending Urban

	FY19 5311 Appropriation	5311 Forecast		Gap	
County		75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi
Barrow	356,850	102,638	62,673	-254,212	-294,177
Bryan	153,844		134,336		-19,508
Carroll	586,929		241,717		-345,212
Effingham	342,856		241,808		-101,048
Haralson	195,205		139,926		-55,279
Jackson	341,984		221,705		-120,279
Walton	350,405		187,394		-163,011
TOTAL	2,328,073	102,638	1,229,559	-254,212	-1,098,514

4.2 Results for States Nationwide

4.2.1 Nationwide Binary Logit Model Results

Appendix A contains the results of the 50 state binary logit models. As part of the modeling process, we estimated a state-specific binary logit model that included all of the variables shown in Equation 3. However, for some states, this specification produced counter-intuitive results. For example, the coefficient associated with jobs was negative (implying the more jobs, the more likely the block was to be rural) or the coefficient associated with distance to roads was positive (meaning the farther you are from a road, the more likely you are to be urban). Given these are clearly counter-intuitive results, we excluded these variables from state-specific models that did not have a positive coefficient for jobs or a negative coefficient for distance to roads. In a similar way, we combined categories associated with the variables that measured the distance from a rural area for rural blocks to ensure that these coefficients were monotonically decreasing, meaning that as you moved farther from the rural area, you were less likely to be urban. Similarly, as the population density increases, we expect that a block would be more likely to be urban (thus, the relationship among population density coefficients should be monotonically increasing as density increases). An example of this process is seen with Rhode Island. Rhode Island combines the rural and (1,2], (2,4] and 4+ categories together (note 4+ is the reference category and assigned a value of zero). Similarly, Rhode Island combines the population density variables for (1000, 2000] and (2000, 4000]. The need to drop variables and/or combine categories was most prevalent in states that were very small (such as Rhode Island, Vermont, and New Hampshire), states that are predominately rural (such as Alaska, Oklahoma, Nevada, and Wyoming), or states that have distinct geographic features (including Hawaii, which is a set of islands). Overall, the accuracy of the nationwide binary logit models is at least 90%, with many states having a higher prediction accuracy. The accuracy of the 50 state binary logit models used to predict urbanization ranged from 90.3% (Delaware) to 98.6% (North Dakota). We concluded that the state-specific binary logit models are performing well, and used these for forecasting land use changes after the 2020 decennial census.

The general results from these models indicate that the three strongest predictors of a block being urban in 2020 were: (1) the block's urban or rural classification in the previous Census; (2) the block's population density; and (3) the distance to an existing UC or UA. These variables and their probabilities can be interpreted as follows:

1. Holding all other variables constant, if the block was classified as urban in the previous Census, it was 99% more likely to be urban in 2020.
2. Holding all other variables constant, if the block's population density was between 500 and more than 4,000 persons per square mile, then it was 88.2% to 94.4% more likely to be urban in 2020.
3. Holding all other variables constant, if the block was classified as rural in the previous Census and was less than 1 to 4 miles from an existing UC or UA, then it was 87.8% to 97.9% more likely to be urban in 2020.

4.2.2 Areas in the Nation that are Trending Urban

Appendix B, Table B1 summarizes the areas in the nation that are trending urban and, specifically, the urban clusters that are expected to merge with other urban clusters or urban areas after the 2020 decennial census. Not all of these mergers will result in a change in funding eligibility, but this is an important first step for understanding where the growth is occurring and for calculating inputs in land areas and populations that are needed to estimate changes in § 5311 and § 5307 allocations after the 2020 decennial census. The UCs that are expected to merge with other UCs or UAs are shown for the four different prediction scenarios. The most aggressive scenario is 1A, which corresponds to the 50% probability model using a ½ mile distance threshold, whereas the most conservative scenario is 2B, which corresponds to the 75% probability model using a 0 mile distance threshold.

The first remarkable result is that predictions are highly sensitive to the underlying rules that are used to determine when a UC merges. Under the most aggressive scenario, a total of 195 UCs/UAs are expected to merge after the 2020 decennial census, whereas under the most conservative scenario, only 20 UCs/UAs are expected to merge. Scenario 1B, which likely represents a "best guesstimate" of the future (with a 50% probability and 0 mile threshold) suggests 86 UCs are expected to merge, and Scenario 2A (with a 75% probability and ½ mile threshold) suggests 112 UCs are expected to merge.

Comparing the states, under the most conservative scenario, Florida (at 6) and Pennsylvania (at 5) have the largest number of UCs/UAs that are expected to be part of a large UA. Under the most aggressive scenario, Texas has the largest number of UCs/UAs that are expected to merge (at 32), followed by Florida (13), North Carolina (12), Arizona (10), and Pennsylvania (10).

4.2.2.1 Highest Risk Transitions for the Most Aggressive Scenario (1A)

Scenario 1A allows for the merging of a UC with either another UC or a UA if the blocks within the UC have at least a 50% probability of being classified as urban after the 2020 census and the UC is located within ½ mile of an existing UC/UA. This scenario is the upper boundary (excluding UA merger scenarios) estimate for urbanization (showing the maximum predicted urbanization) under the current U.S. Census Bureau urbanization rules.

Selecting for blocks with a 50% probability of urbanizing and assuming a merge if the UC is within ½ mile of the UA, the total number of UCs/UAs was reduced to 3,427 from 3,573. A total of 102 UCs are predicted to undergo a "high-risk" transition from a UC to a large urbanized area. A total of 49 UCs are predicted to merge into another UC, and a total of 44 UCs are predicted to merge into a small UA. A full list of all mergers under this scenario is included in Appendix B, Table B1. The high-risk transitions are denoted by an asterisk (*) on the table.

4.2.2.2 Highest Risk Transitions for the Least Aggressive Scenario (2B)

Scenario 2B allows for the merging of a UC with either another UC or a UA if the blocks within the UC have at least a 75% probability of being classified as urban after the 2020 census and the UC shares contiguous borders (a distance of 0.0 miles) with an existing UC/UA. This scenario is the lower boundary estimate for urbanization (showing the minimum predicted urbanization) under the current U.S. Census Bureau urbanization rules.

Under this scenario, the total number of UCs/UAs was reduced to 3,560 from 3,573 UCs/UAs in 2010. A total of 6 UCs were predicted to undergo a "high-risk" transition from a UC to a large UA (see highlighted rows in Table 12). A total of 8 UCs were predicted to merge into another UC, and a total of 6 UCs were predicted to merge into a small UA. The list of UCs and their respective mergers are shown below in Table 12. A full list of all mergers under this scenario is also included in Appendix B, Table B1.

TABLE 12

Urban Clusters Predicted to Merge Under Scenario 2B (U.S. Census Bureau 2010)

State	2010 Urban Cluster	Name of UC/UA Predicted to Merge Into	UC/UA LSAD
Alabama	Priceville, AL	Decatur, AL	UA
Connecticut	Willimantic, CT	Hartford, CT	UA
Delaware	Bridgeville, DE	Salisbury, MD–DE	UA
Florida	Crystal River, FL	Homosassa Springs–Beverly Hills–Citrus Springs, FL	UA
	Fernandina Beach, FL	Yulee, FL	UC
	Four Corners, FL	Winter Haven, FL	UA
	Panama City Northeast, FL	Panama City, FL	UA
	Poinciana, FL	Kissimmee, FL	UA
	Yulee, FL	Fernandina Beach, FL	UC
Georgia	Winder, GA	Atlanta, GA	UA
Louisiana	Donaldsonville, LA	Houma, LA	UA
New Jersey	Newton, NJ	New York–Newark, NY–NJ–CT	UA
Ohio	Ashtabula, OH	Conneaut, OH	UC
	Conneaut, OH	Ashtabula, OH	UC
Pennsylvania	Jersey Shore, PA	Lock Haven, PA	UC
	Lock Haven, PA	Jersey Shore, PA	UC
	Lykens, PA	Williamstown, PA	UC
	Roaring Spring, PA	Altoona, PA	UA
	Williamstown, PA	Lykens, PA	UC
Virginia	Purcellville, VA	Washington, DC–VA–MD	UA

Note: High-risk transitions (from rural to large urban) are shaded.

4.2.2.3 Internal UC/UA Growth

An existing UC or UA also can urbanize without merging/gaining urbanized land area. *Internal growth* occurs through population growth inside the existing UC/UA boundaries. The following tables show sets of internal growth: (1) UCs growing into a small urban area (Table 13 and Table 14), and (2) small urban areas growing into large urban areas (Table 15 and Table 16). Even if a UC is not predicted to merge in one of the scenarios discussed in this thesis, it could still be subject to urbanization through internal growth. UCs that are candidates for both merging and internal growth are of particular concern for this project.

Urban Cluster to Small Urban Growth

Table 13 and Table 14 include areas that were classified as UCs (under 50,000 people) in 2010, but are predicted to grow internally to have a population of greater than 50,000 in 2020. This growth would cause these areas to not only shift from classification as UCs to small UAs, but also puts these areas at risk for transitioning from FTA § 5311 to § 5307 funding. The highlighted rows in the tables are UCs that have a projected population of 47,500 or greater (within a 5% margin of the small UA threshold) in 2020. It is important to consider these areas in this scenario to adjust for potential under-prediction by any of the state regression models.

For the most aggressive scenario (i.e., 50% probability of having a population of at least 50K), a total of 22 UCs are predicted to grow internally to become small UAs, with an additional 11 UCs within a 5% margin of the threshold. These areas are highlighted in Table 13. Five of the UCs listed in Table 13 are also listed to merge under the 50% model. These UCs include:

1. Bullhead City, AZ–NV; predicted to merge with the Laughlin, NV UC
2. Poinciana, FL; predicted to merge with the Kissimmee, FL UA; also listed as a rural to large UA transition
3. Winder, GA; predicted to merge with the Atlanta, GA UA; also listed as a rural to large UA transition
4. Carolton, GA; predicted to merge with the Atlanta, GA UA; also listed as a rural to large UA

5. Sandusky, OH; predicted to merge with the small UA Lorain–Elyria, OH

The UCs at risk for transitioning from UC to small UA under a more conservative model (i.e., 75% probability) are listed in Table 14. A total of 14 UCs are predicted to grow to over 50,000 people, with an additional 15 UCs that have a population within a 5% margin of the UA threshold.

TABLE 13

UCs Predicted to Grow into Small UAs Under the 50% Model

State Name	2010 UC Name	2010 Population	2020 Population
Alaska	Lakes–Knik-Fairview–Wasilla, AK	44,236	59,230
Arizona	Maricopa, AZ	42,337	52,364
	Sahuarita–Green Valley, AZ	40,691	50,100
	Bullhead City, AZ–NV	48,656	54,463
California	Hollister, CA	42,002	47,984
	Reedley–Dinuba, CA	46,247	53,208
Florida	Poinciana, FL	41,922	50,426
Georgia	Carrollton, GA	42,872	49,187
	Winder, GA	37,831	49,220
Idaho	Twin Falls, ID	48,836	56,333
Kansas	Salina, KS	47,493	48,714
Kentucky	Paducah, KY–IL	48,791	51,043
Michigan	Traverse City, MI	47,109	51,396
Montana	Bozeman, MT	43,164	53,030
	Helena, MT	45,055	51,073
North Carolina	Morehead City, NC	44,798	50,989
	Wilson, NC	49,190	51,605
North Dakota	Minot, ND	42,650	59,936
New Mexico	Clovis, NM	41,570	50,077
	Roswell, NM	49,727	50,283
Ohio	Findlay, OH	48,441	48,649
	Marion, OH	46,384	47,978
	New Philadelphia–Dover, OH	46,366	48,732
	Sandusky, OH	48,990	48,157
Oklahoma	Enid, OK	47,609	50,694
	Stillwater, OK	44,515	50,585
South Carolina	Beaufort–Port Royal, SC	48,807	56,087
Tennessee	Cookeville, TN	44,207	50,567
Texas	Eagle Pass, TX	49,236	54,707
	Galveston, TX	44,022	47,782
	Lufkin, TX	44,927	49,527
	Rio Grande City–Roma, TX	46,344	57,116
Virginia	Danville, VA–NC	49,344	49,698

Source: U.S. Census Bureau 2010. Highlighted rows are just under the 50,000 population threshold for being classified as small UAs.

TABLE 14

UCs Predicted to Grow into Small UAs Under a 75% Model

State Name	2010 UC Name	2010 Population	2020 Population
Alaska	Lakes–Knik-Fairview–Wasilla, AK	44,236	54,630
Arizona	Maricopa, AZ	42,337	51,773
	Sahuarita–Green Valley, AZ	40,691	49,217
	Bullhead City, AZ–NV	48,656	53,336
California	Reedley–Dinuba, CA	46,247	52,360
Florida	Poinciana, FL	41,922	50,419
Georgia	Carrollton, GA	42,872	47,695
Idaho	Twin Falls, ID	48,836	55,300
Kansas	Salina, KS	47,493	48,393
Kentucky	Paducah, KY–IL	48,791	50,349
Michigan	Traverse City, MI	47,109	50,151
Montana	Bozeman, MT	43,164	52,277
	Helena, MT	45,055	49,311
North Carolina	Morehead City, NC	44,798	49,031
	Wilson, NC	49,190	50,709
North Dakota	Minot, ND	42,650	58,639
New Mexico	Clovis, NM	41,570	49,657
	Roswell, NM	49,727	49,690
Ohio	Findlay, OH	48,441	48,049
	New Philadelphia–Dover, OH	46,366	47,974
	Sandusky, OH	48,990	47,882
Oklahoma	Enid, OK	47,609	49,753
	Stillwater, OK	44,515	49,451
South Carolina	Beaufort–Port Royal, SC	48,807	52,770
Tennessee	Cookeville, TN	44,207	48,756
Texas	Eagle Pass, TX	49,236	53,822
	Lufkin, TX	44,927	48,599
	Rio Grande City–Roma, TX	46,344	55,519
Virginia	Danville, VA–NC	49,344	47,998

Source: U.S. Census Bureau 2010. Highlighted rows are just under the 50,000 population threshold for being classified as small UAs.

Small Urban to Large Urban Shifts

No small UAs were predicted to grow internally to become large UAs. However, there were 7 small UAs in the 50% model and 10 small UAs in the 75% model that were within a population margin of 9,000 people (4%). These UAs are listed in Table 15 and Table 16.

TABLE 15

Small UAs Close to Growing into a Large UA Under 50% Model

UA Name	2010 Population	2020 Population
Erie, PA	196,611	198,502
Olympia–Lacey, WA	176,617	198,491
Clarksville, TN–KY	158,655	197,088
Waterbury, CT	194,535	194,196
Sioux Falls, SD	156,777	193,979
North Port–Port Charlotte, FL	169,541	193,968
Cedar Rapids, IA	177,844	192,891

Source: U.S. Census Bureau 2010.

TABLE 16

Small UAs Close to Growing into a Large UA Under 75% Model

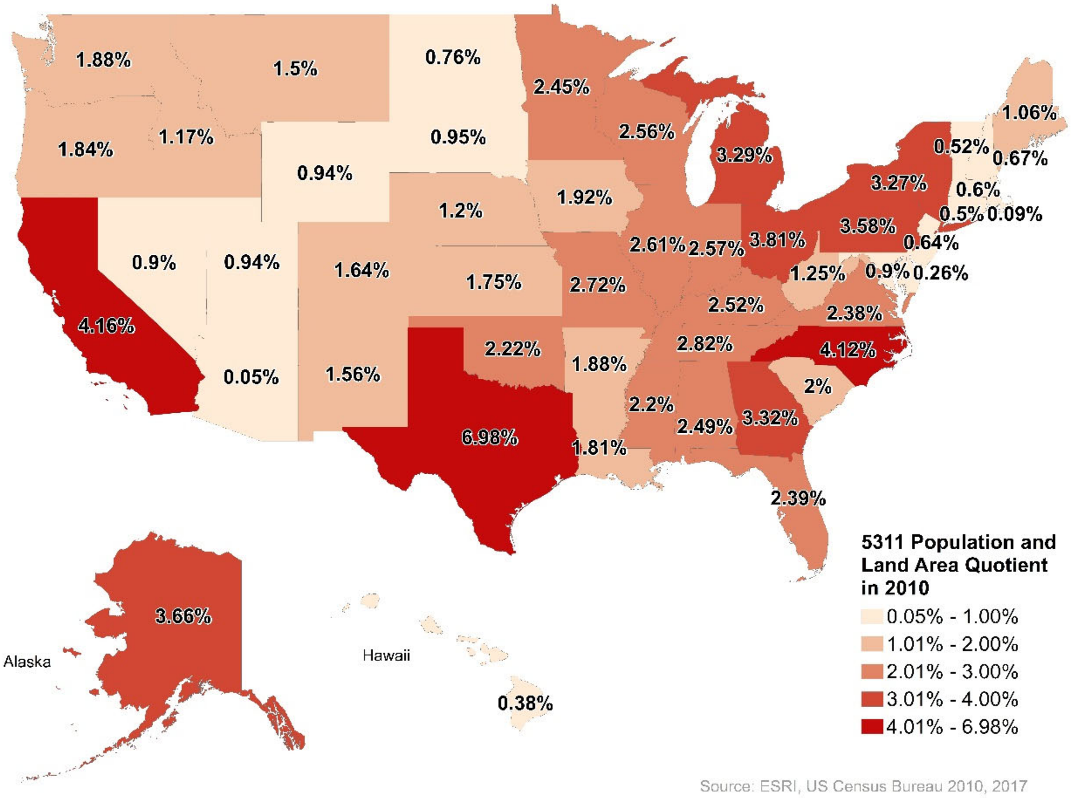
UA Name	2010 Population	2020 Population
College Station–Bryan, TX	171,345	198,928
Gainesville, FL	187,781	198,031
Erie, PA	196,611	197,945
Olympia–Lacey, WA	176,617	197,011
Salinas, CA	184,809	196,981
Deltona, FL	182,169	196,173
Waterbury, CT	194,535	193,993
Waco, TX	172,378	193,527
Clarksville, TN–KY	158,655	193,514
Sioux Falls, SD	156,777	191,214

Source: U.S. Census Bureau 2010.

4.2.3 Forecasts of Nationwide § 5311 Funding Levels After the 2020 Census

The apportionment quotient for states in 2010 for the § 5311 rural funding program is shown in Figure 10. The quotient represents each state's unconstrained share of the appropriated funds through the § 5311 formula. This quotient was calculated by dividing each state's national share of non-urbanized land area and population over the total non-urbanized land area and population for the U.S. in 2010. Each state's land area portion was multiplied by 20% and the population portion was multiplied by 80%. These two percentages are used to determine the state's total apportionment. No state is eligible to receive more than a 5% share of their portion of non-urbanized land area (i.e., Alaska and Texas). This was not corrected for in the percentages reported below, and, therefore, they are unconstrained; however, this only affected 1.98% of funding nationally, from one state (i.e., Texas), in 2010.

As depicted in Figure 10, those states that are eligible to receive the highest share of § 5311 funding include Texas, California, North Carolina, Alaska, and Ohio. It could be expected that vastly rural western states, such as Montana, Wyoming, Nevada, etc., would receive a higher quotient of § 5311 funding, but this is not so because those states' shares of non-urbanized population are low relative to other states. Since the highest weighted input into the funding formula is non-urbanized population, those states do not receive a large portion of § 5311 funding. The maps provided in the next section show percent change in the § 5311 population and land area quotient relative to the numbers presented in this 2010 map.



Sources: ESRI 2017; U.S. Census Bureau 2010, 2017.

FIGURE 10

FTA § 5311 Apportionment Quotient for 2010 by State

The two key inputs into the FTA § 5311 apportionment quotient is non-urbanized population and non-urbanized land area. To predict the FTA § 5311 apportionment for 2020, we needed to estimate these two inputs. The predictions for the FTA § 5311 apportionment for 2020 are presented below for two scenarios: Scenario 1A (corresponding to the most aggressive scenario we examined) and Scenario 2B (corresponding to the most conservative scenario we examined).

Also, note that although the topic of this report is on the *urbanization* of rural areas in the U.S., the results are presented in the context on *non-urbanized* land area and population.

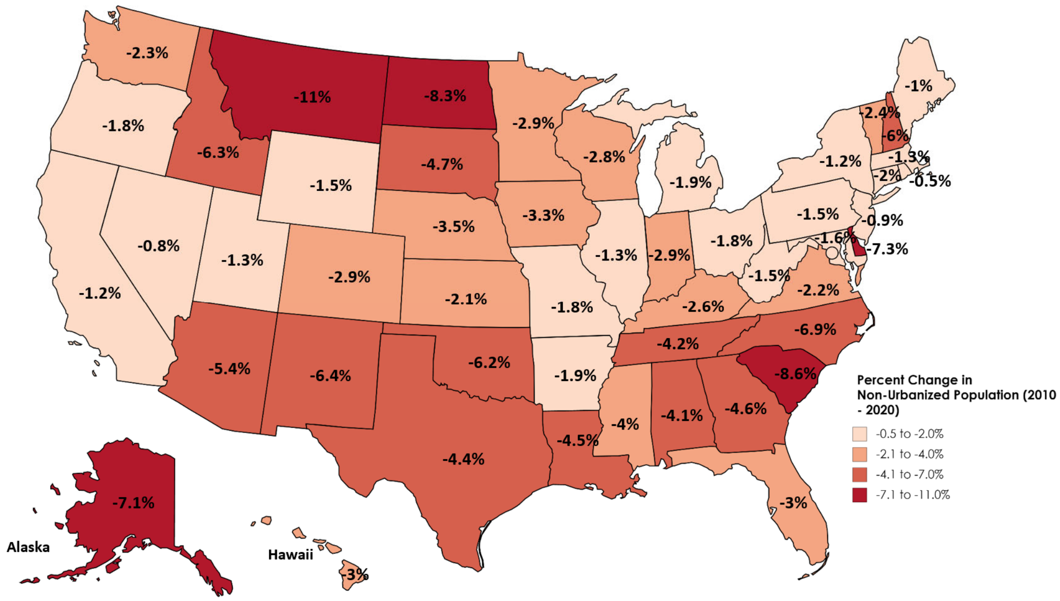
This is to show the non-urbanized land area and population deficits throughout the country to understand which states or regions are likely to be subjected to the aforementioned issues with urbanization and FTA § 5311 funding because of urbanization. Those states with negative percent differences in apportionment will be presented with a funding gap.

4.2.3.1 § 5311 Allocation Forecasts for the Most Aggressive Forecast Scenario (1A)

Using the ESRI population data, the national total non-urbanized population is predicted to decrease by 1,695,956 people, which would represent a 1.9% overall reduction in non-urbanized population between 2010 and 2020 for Scenario 1A (see Figure 11). For the remaining urbanization/merger scenarios, the national change in non-urbanized population is:

- Scenario 1B (50% probability and within 0 miles): An ***increase*** of 0.65% (or 573,835)
- Scenario 2A (75% probability and within ½ mile): An ***increase*** of 2.73% (or 2,428,140 persons)
- Scenario 2B (presented in Section 4.2.3.2; 75% probability and within 0 miles): An ***increase*** of 3.18% (or 2,832,743 persons)

So, the national percent change between the urbanization scenarios (excluding the UA merger scenarios), non-urbanized population is predicted to change between −1.91% and 3.18%.

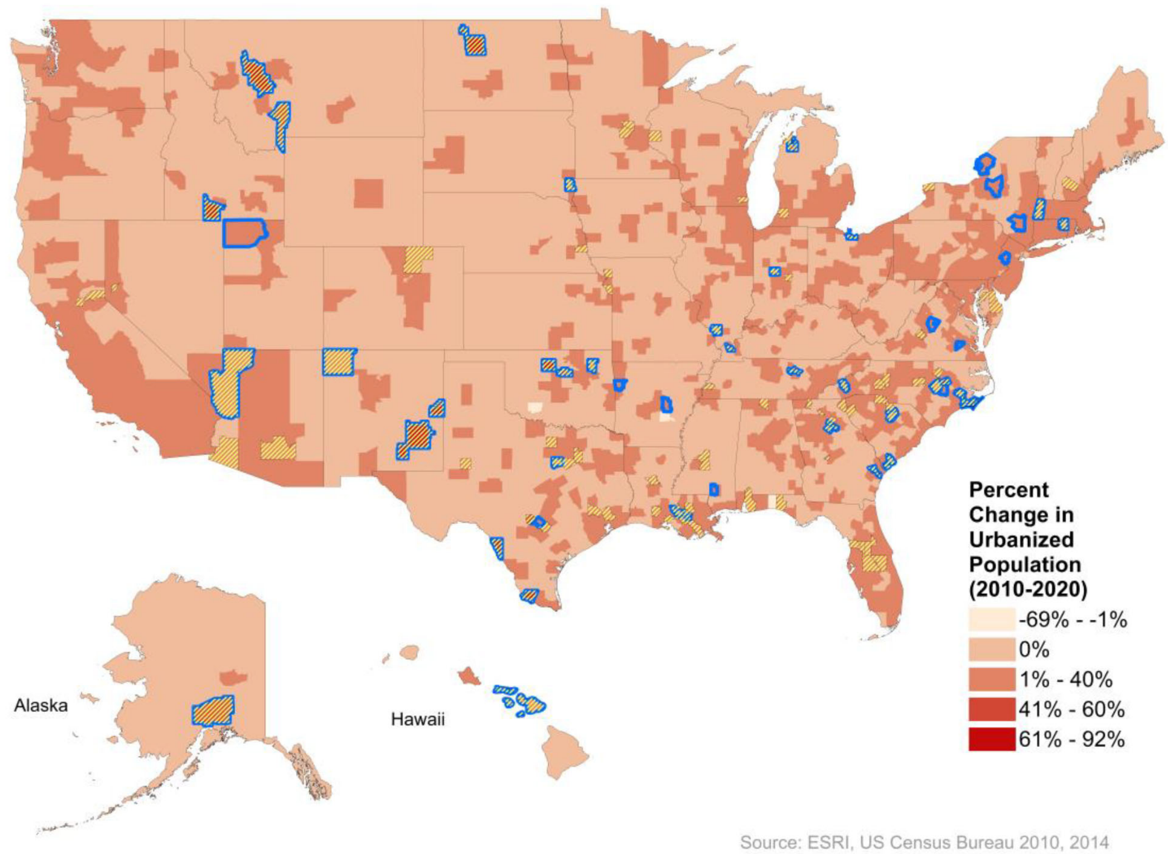


Sources: Mapchart.net 2019; U.S. Census Bureau 2010, 2017.

FIGURE 11

Percent Change in Non-Urbanized Population Under Scenario 1A by State Between 2010 and 2020

Urbanization is also modeled at the county level to show which counties within each state may be the drive behind the state's overall change (see in Figure 12). The blue outlines (50 counties in total) indicate that the county grew from less than to greater than 50% urbanized population between 2010 and 2020. A full list of these counties is included in Table 17. Further, under Scenario 1A, a total of 41 counties are predicted to become principally urban, with a total urbanized population surpassing the 89% threshold set forth by the U.S. Census Bureau (Ratcliffe et al. 2016). These counties in particular are of concern as they are predicted to become principally urban after the 2020 census. In Figure 12, these counties are represented by a yellow crosshatch.



*Notes: Counties predicted to grow to more than 50% urbanized population in blue; counties predicted to increase more than 10% in urbanized population in yellow crosshatch.
Sources: ESRI 2017; U.S. Census Bureau 2010, 2014.

FIGURE 12

Percent Change in Urbanized Population Under Scenario 1A by County Between 2010 and 2020

TABLE 17

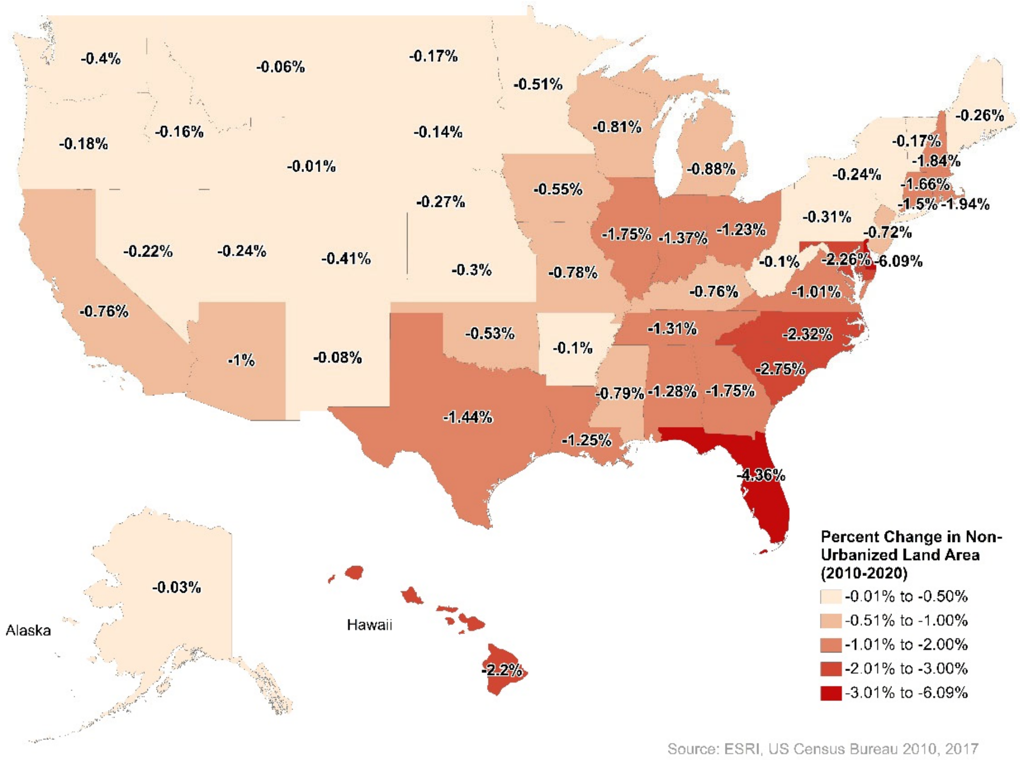
Counties that Grew to over 50% Urbanized Population – Scenario 1A

County Name	State	2010 % Urban Pop.	2020 % Urban Pop.	% Change Urban Pop.	% Change Urban Land Area	County Name	State	2010 % Urban Pop.	2020 % Urban Pop.	% Change Urban Pop.	% Change Urban Land Area
Matanuska–Susitna Borough	AK	0.0%	55.9%	55.9%	0.4%	Wayne	NC	49.8%	59.2%	9.4%	6.1%
Crawford	AR	48.0%	52.0%	3.9%	0.6%	Wilson	NC	0.8%	63.9%	63.1%	7.2%
Lonoke	AR	45.2%	51.0%	5.8%	0.3%	Ward	ND	0.0%	71.1%	71.1%	1.4%
Mohave	AZ	26.7%	52.5%	25.8%	0.4%	Hunterdon	NJ	45.6%	50.3%	4.8%	1.3%
Windham	CT	27.8%	53.8%	26.0%	3.8%	Chaves	NM	0.0%	75.5%	75.5%	0.5%
Barrow	GA	16.7%	82.8%	66.1%	38.7%	Curry	NM	0.0%	86.2%	86.2%	1.6%
Bryan	GA	30.6%	55.9%	25.4%	3.6%	San Juan	NM	40.8%	55.3%	14.5%	0.4%
Oconee	GA	49.7%	65.1%	15.5%	12.8%	Jefferson	NY	49.8%	50.5%	0.8%	0.0%
Walton	GA	33.4%	63.1%	29.8%	9.4%	Oneida	NY	49.4%	50.1%	0.7%	0.0%
Maui	HI	36.1%	53.2%	17.1%	4.0%	Ulster	NY	48.8%	51.4%	2.6%	0.5%
Twin Falls	ID	0.0%	65.1%	65.1%	1.0%	Erie	OH	8.4%	71.7%	63.3%	12.1%
Jackson	IL	46.8%	65.7%	18.9%	3.7%	Garfield	OK	0.0%	78.3%	78.3%	2.4%
Boone	IN	38.4%	51.6%	13.2%	4.2%	Payne	OK	0.0%	59.9%	59.9%	3.1%
McCracken	KY	0.0%	73.8%	73.8%	18.1%	Rogers	OK	20.6%	54.5%	33.9%	5.8%
St. James Parish	LA	0.0%	61.6%	61.6%	7.2%	Beaufort	SC	42.5%	81.8%	39.3%	10.5%
Iberville Parish	LA	34.4%	52.2%	17.8%	1.9%	Kershaw	SC	20.4%	53.1%	32.7%	4.5%
Berkshire	MA	45.1%	59.2%	14.1%	1.1%	Lincoln	SD	49.5%	62.6%	13.1%	2.3%
Grand Traverse	MI	0.0%	52.5%	52.5%	9.1%	Putnam	TN	0.0%	64.5%	64.5%	11.6%
Lamar	MS	49.6%	57.3%	7.6%	2.6%	Comal	TX	49.0%	57.2%	8.2%	9.3%
Gallatin	MT	0.0%	50.0%	50.0%	0.8%	Johnson	TX	29.4%	68.9%	39.5%	10.4%
Lewis and Clark	MT	0.0%	73.3%	73.3%	0.8%	Maverick	TX	0.0%	91.7%	91.7%	1.6%
Carteret	NC	0.0%	68.8%	68.8%	9.3%	Starr	TX	0.0%	80.6%	80.6%	2.3%
Craven	NC	48.8%	73.2%	24.4%	4.6%	Box Elder	UT	49.1%	52.2%	3.1%	0.4%
Johnston	NC	22.2%	55.1%	32.9%	8.8%	Albemarle	VA	49.4%	52.2%	2.8%	2.1%
Haywood	NC	44.6%	56.0%	11.4%	3.8%	Prince George	VA	46.6%	56.4%	9.8%	5.0%

Additionally, non-urbanized land area was reduced by 7.13% nationally. The percent change by state is illustrated in Figure 13, with Florida, North Carolina, and South Carolina having the largest reduction in non-urbanized area. For the remaining urbanization/merger scenarios, the national change in non-urbanized land area is:

- <u>Scenario 1B (50% probability and within 0 miles)</u>: A ***decrease*** of 7.05% (or 242,864 square miles)
- <u>Scenario 2A (75% probability and within ½ mile)</u>: A ***decrease*** of 6.52% (or 224,638 square miles)
- <u>Scenario 2B (presented in Section 4.2.3.2; 75% probability and within 0 miles)</u>: A ***decrease*** of 6.55% (or 225,960 square miles)

Between the four scenarios (excluding the UA merger scenarios), the national percent change in non-urbanized land area is predicted to be between −6.52% and −7.13%. Considering these predictions in conjunction with the non-urbanized population changes, an increase in urbanized land area does not always coincide with an increase in urbanized population.

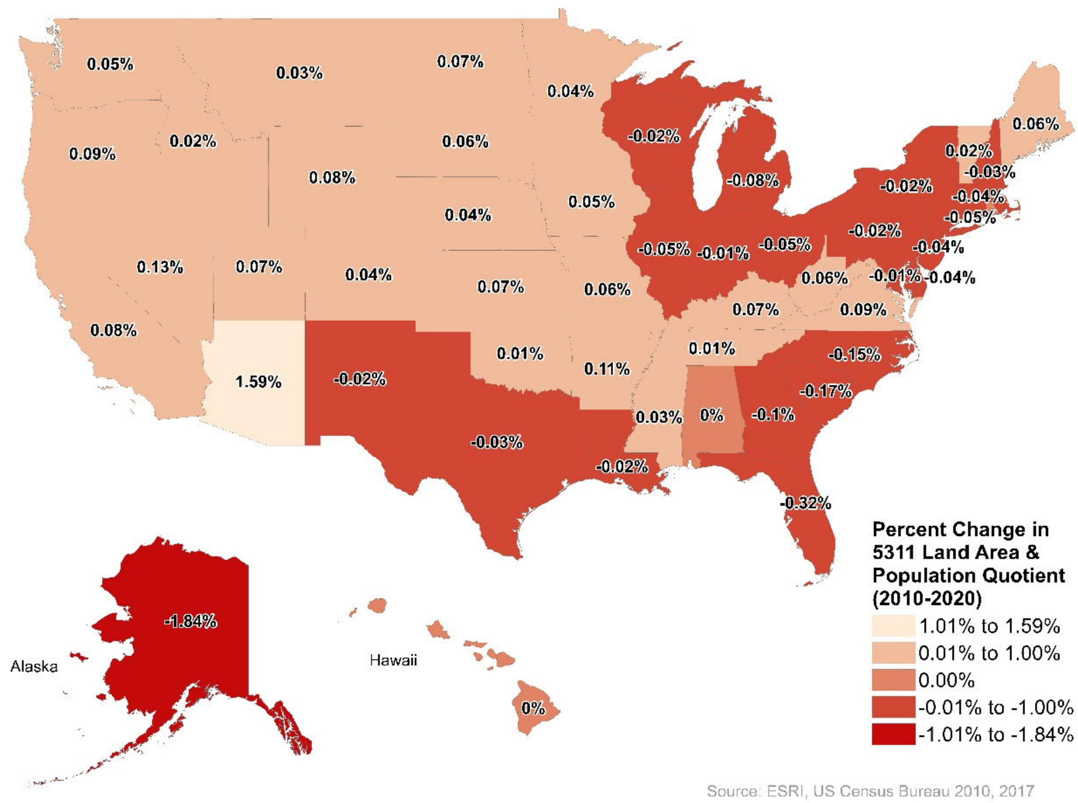


Sources: ESRI 2017; U.S. Census Bureau 2010, 2017.

FIGURE 13

Percent Change in Non-Urbanized Land Area Under Scenario 1A by State Between 2010 and 2020

As a result of these predicted shifts in non-urbanized population and land area, the overall FTA § 5311 land area and population quotients for all but three states (Hawaii, Georgia, and Rhode Island) are expected to change under Scenario 1A (the most aggressive scenario). Figure 14 illustrates the percent shift in each state's quotient based on the 2010 quotient percentages presented in Figure 10. A total of 26 states are predicted to have an increase in their FTA § 5311 population and land area quotients (ranging from 0.01 to 1.01%); this could likely lead to an increase in § 5311 funding for these states after the 2020 census. Twenty-one (21) states are to have a reduced quotient for the § 5311 apportionment formula (ranging from −0.01 to −1.84%), indicating a likely reduction in the apportionment for these states after 2020. See Appendix C, Table C1 for additional details on the changes in urbanized populations, land areas, and FTA § 5311 funding.



Sources: ESRI 2017; U.S. Census Bureau 2010, 2017.

FIGURE 14

Percent Change in Land Area and Population Quotient under Scenario 1A for the FTA § 5311 Formula by State between 2010 and 2020

Florida is an example of a state that is expected to have a reduced quotient for the § 5311 formula. Florida's binary logit model predicted urbanization correctly 93.5% of the time. Between 2010 and 2020, Florida is predicted to lose a total of 3% of its non-urbanized population and 4.36% of its non-urbanized land area under this scenario. This can also be interpreted that the state is predicted to gain both urbanized population and land area over the 10-year period, or, simply put, the state is predicted to become more urban. In 2010, the state held 2.65% of the country's total non-urbanized population and 1.36% of the country's non-urbanized land area. In 2020, for Scenario 1A, these percentages were calculated to be 2.25% and 1.39%, respectively. Florida's total share of non-urbanized population is predicted to drop, although its share of the nation's non-urbanized land area actually was predicted to increase. So, even though the state's raw quantity of square miles is predicted to decrease (46,790 mi^2 to 44,465 mi^2), the percentage is predicted to increase because there was an overall loss in non-urbanized land area throughout the country (245,851 mi^2 in total).

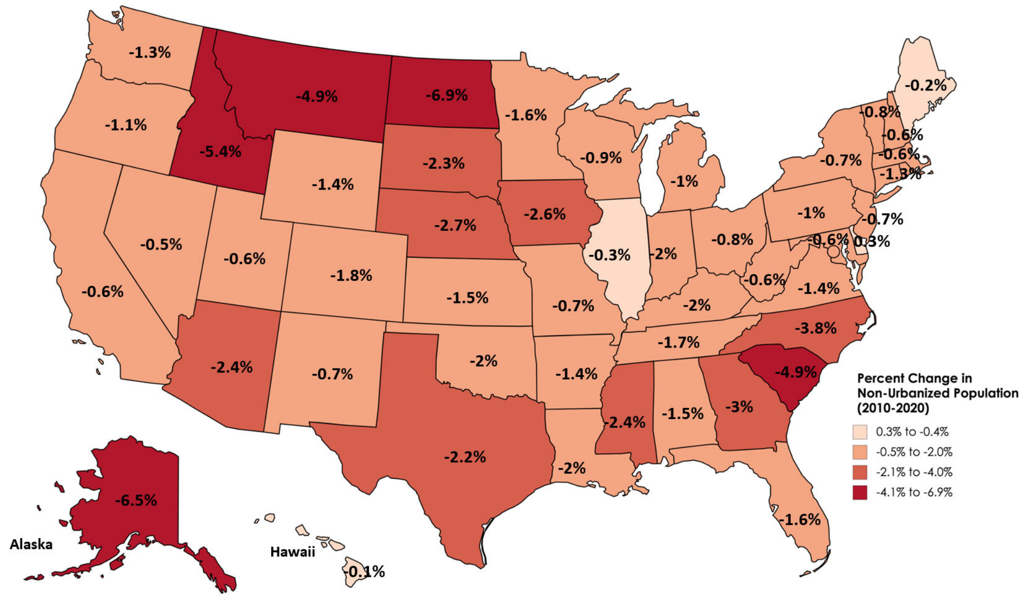
The population component to Florida's § 5311 quotient (80% of the state's relative national share of non-urbanized population) was reduced from 2.12% to 1.8% in 2020. The land area component of the § 5311 quotient (20% of the state's relative national share of non-urbanized land area) increased by 0.01% for the reasons listed above. This goes to say that a state's portion of non-urbanized land area is a stronger determinant for its § 5311 apportionment total. Further, almost all of the states that were predicted to experience a decrease in their overall § 5311 quotients held a large share of the nation's non-urbanized population relative to the states that were not predicted to experience a decrease in § 5311 quotients. In other words, states that hold a large share of the nation's non-urbanized population and experienced a decrease in both non-urbanized population and land area between 2010 and 2020 were modeled to have a decrease in the § 5311 quotient.

4.2.3.2 Forecasts of § 5311 Funding for the Most Conservative Scenario (2B)

Scenario 2B allows for the merging of a UC with either another UC or a UA if the blocks within the UC have at least a 75% probability of being classified as urban after the 2020 census and the UC shares contiguous borders (a distance of 0.0 miles) with an existing UC/UA. This scenario is the lower boundary estimate for urbanization (showing the minimum predicted urbanization) under the current U.S. Census Bureau urbanization rules.

Our models predict the national total non-urbanized population to grow by 2,832,743 people in this scenario, which amounts to a 3.18% overall increase in non-urbanized population between 2010 and 2020 for Scenario 2B. The states of Delaware, Maine, Rhode Island, and Hawaii all were predicted to experience increases in non-urbanized population between 2010 and 2020. Alaska, North Dakota, and Idaho were predicted to lose over 5% of their non-urbanized populations (see Figure 15).

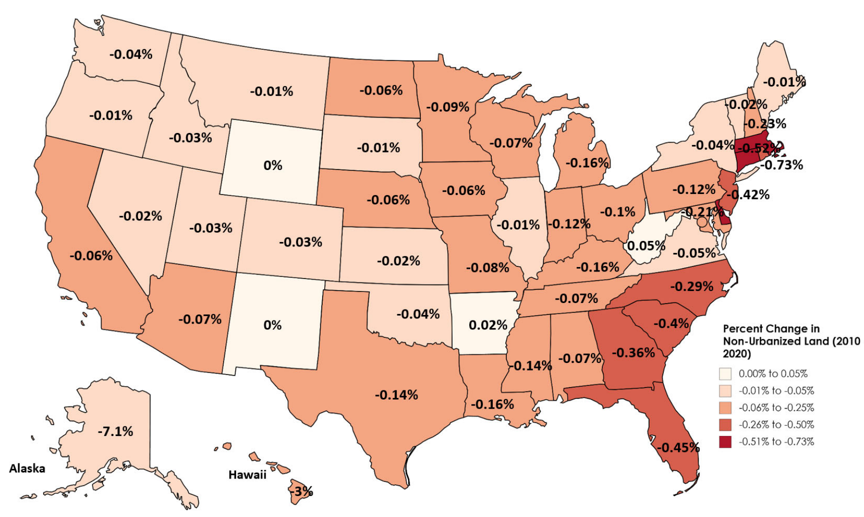
For Scenario 2B, non-urbanized land area across the U.S. was reduced by 6.55% between 2010 and 2020. This change is illustrated by state in Figure 16. Connecticut (−0.73%), Delaware (−0.59%), and Massachusetts (−0.52%) experienced a decrease in non-urbanized land area of more than −0.5%. At the county level (Figure 17), almost all of the counties in Connecticut, Delaware, and Massachusetts were predicted to experience an increase in urbanized land area between 1% and 10%.



Sources: Mapchart.net 2019; U.S. Census Bureau 2010, 2017.

FIGURE 15

Percent Change in Non-Urbanized Population Under Scenario 2B by State Between 2010 and 2020

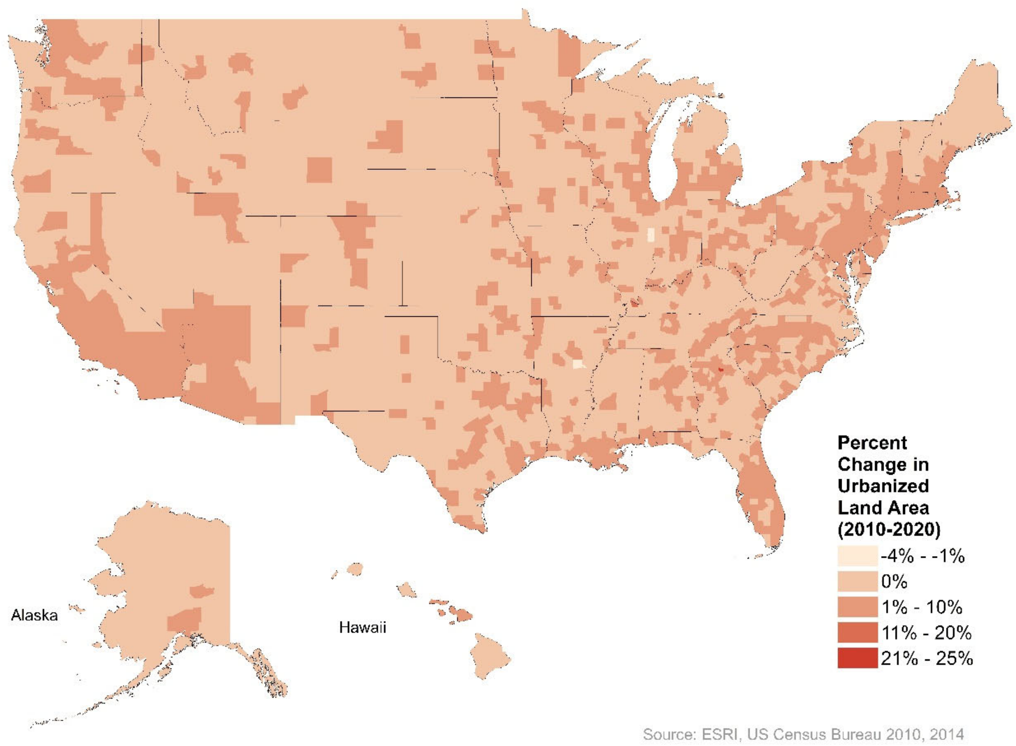


Sources: Mapchart.net 2019; U.S. Census Bureau 2010, 2017.

FIGURE 16

Percent Change in Non-Urbanized Land Area Under Scenario 2B by State Between 2010 and 2020

As a result of these predicted shifts in non-urbanized population and land area, the overall FTA § 5311 land area and population quotients for all but four states (Idaho, Maryland, Vermont, and Rhode Island) are expected to change. Figure 18 illustrates the percent shift in each state's quotient based on the 2010 quotient percentages presented in Figure 10. Similar to Scenario 1A, a total of 28 states are predicted to have an increased § 5311 land area and population quotient (ranging from 0.01% to 1.01%), whereas 18 states are predicted to have a reduced quotient (ranging from −0.01 to −1.86%). Generally, the same states are predicted to have a reduced § 5311 quotient as in Scenario 1A, although to a lesser degree, with the exception of New Mexico, Texas, Louisiana, Maryland, Delaware, and New Hampshire. Additionally, Mississippi and Iowa are predicted to have a reduced § 5311 population and land area quotient in Scenario 2B, whereas in Scenario 1A, both states were predicted to have an increased § 5311 quotient.

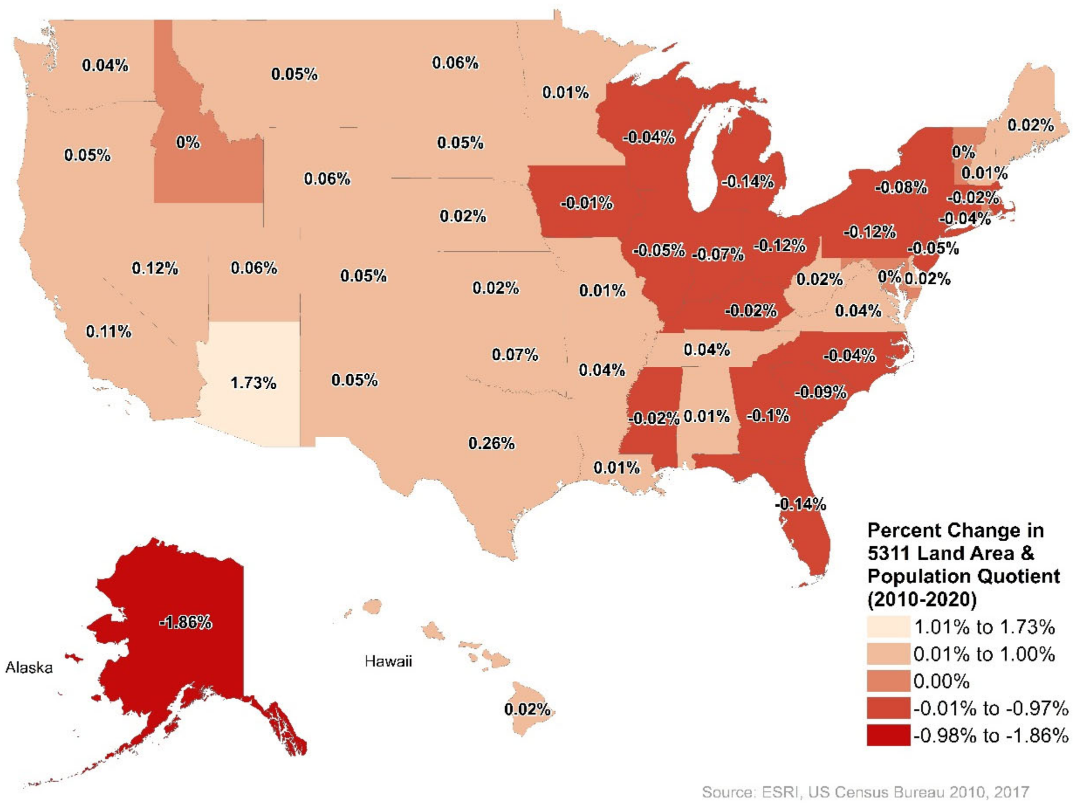


Sources: ESRI 2017; U.S. Census Bureau 2010, 2014.

FIGURE 17

Percent Change in Urbanized Land Area Under Scenario 2B by County Between 2010 and 2020

As with Scenario 1A, all of the states predicted to have a reduced § 5311 population and land area quotient after 2020 are concentrated in the eastern part of the U.S. (with the exception of Alaska). This could be correlated with the size of the counties in this area of the country, which are much smaller in terms of land area than counties in the western states. Counties with a large land area will inherently have smaller population densities relative to the population densities in counties with a small total land area. The eastern states shaded in dark orange (−0.01% to −0.97%) that have small land areas are more vulnerable to shifts in population.



Sources: ESRI 2017; U.S. Census Bureau 2010, 2014.

FIGURE 18

Percent Change in Land Area and Population Quotient under Scenario 2B for the FTA § 5311 Formula by State between 2010 and 2020

Under Scenario 2B, Michigan is expected to have a 0.14% decrease in its § 5311 population and land area quotient. Similar trends to those in Florida under Scenario 1A are predicted to occur in Michigan under this scenario. Michigan's non-urbanized population is predicted to decrease by nearly 77,000 people, which equates to a 0.2% drop in the state's national share of non-urbanized population (dropping to 3.53% from 3.73%). Michigan's national share of non-urbanized land area is predicted to remain fairly constant (only losing 70 square miles of rural land area), but its percent share actually increased from 1.55% to

1.66%. This is due to the predicted overall loss of national non-urbanized area, which decreases the denominator. This is the same trend modeled under Scenario 1A, but with a lesser degree of change in quotients.

4.2.4 Forecasts of Nationwide § 5311 and § 5307 Funding Levels After the 2020 Census

The analysis above showed that the decline in rural populations and land areas is occurring at about the same rate across the nation. In the event that transit funding is reauthorized at the current levels, we would not expect to see notable changes in § 5311 funding levels. However, it is possible that transit funding for the § 5311 and § 5307 programs would change to reflect the shift in population trends that is occurring across the nation.

We predicted the amount of funding that would be needed after the 2020 decennial census for each program by using the current appropriation formulas and FY19 FTA data values, and updating the inputs to reflect changes in rural and urban populations. We did this for the most conservative and least conservative scenarios. The results of this analysis are summarized in Table 18. Tables C1–C5 in Appendix C contain more details and summarize these changes for each state. Note that modeling assumptions, our results differed slightly from the "actual" results. In particular, we predicted FY18 § 5311 and § 5307 appropriations of $629M versus the actual of $659M and $4.6B versus the actual of $5.1B in our calculations, respectively.

As seen in Table 18, there are large potential shifts across the programs, with the rural and large urban 1M+ areas losing allocations. Stated another way, there is an increased need for funding to support small urban areas, particularly those with populations between 50K and 200K. The funding needs of the small urban areas with populations between 50K and

200K is expected to increase by 37% to 51%, and the funding needs of small urban areas with populations between 200K and 1M is expected to grow 23% to 24%. Viewed in the context of the entire analysis, it is clear that the overall needs in transit funding by system size will be different in 2020 than they were in 2010.

TABLE 18

Predicted Changes in § 5311 and § 5307 Funding After 2020 (Assumes FY19 FTA Data Values)

Funding Source (Population)	Current Appropriation*	Predicted Appropriation	Difference	% Difference
5311 rural (<50K)	629M	483 to 505M	−124 to −146M	−20 to −23
5307 small urban (50K–200K)	402M	550 to 608M	148 to 206M	37 to 51
5307 large urban (200K–1M)	839M	1.035 to 1.044B	196 to 205M	23 to 24
5307 large urban (1M+)	3.38B	3.00 to 3.06B	−316 to −358M	−9 to −11
TOTAL	5.25B	5.13 to 5.16B	−118 to −71M	−1.4 to −2.2

*Note: Actual appropriations differ slightly due to modeling assumptions. FY19 § 5311 (that includes the 5340 growing states) appropriation was $630M (vs. $628M) and FY19 § 5307 appropriation was $4.80B (vs. $4.62B in our calculations). See Federal Register (2019) for the appropriation amounts and Appendix C for more details. Note that the numbers reported on the table above do not include the 5340 growing states portion in the totals.

4.3 Additional Analysis Conducted for Georgia

4.3.1 Georgia's Outlook After the 2020 Decennial Census

The overall outlook for future § 5311 and § 5307 appropriations for Georgia is quite positive, in part because the state has many areas that have been growing at a pace that is above the national average. As such, Georgia has one of the highest appropriations from the § 5340 growing states program. According to the FTA website, "the Growing States and High Density States Formula Program (49 U.S.C. 5340) was established by SAFETEA-LU [Safe, Accountable, Flexible, Efficient Transportation Equity Act: A

Legacy for Users] to apportion additional funds to the Urbanized Area Formula and Rural Area Formula programs" (FTA 2016). If this program continues, it will help mitigate potential losses in funding from the § 5311 appropriations for Georgia (and likely other states). Nationally, the predicted appropriation for the § 5307 program was forecast to decline −1.4% to −2.2%. As shown in Table 19, Georgia's higher-than-average growth suggests an increase of 5.2% to 6.3% in the overall § 5307 program (again, assuming the FY19 FTA data values are used to set future appropriation levels after the 2020 decennial census).

TABLE 19

Georgia's Funding Outlook After 2020
(Assumes FY19 FTA Data Values)

Funding Source	Current Appropriation	Predicted Appropriation	Difference	% Difference
5311 rural	21.2M	15.9 to 16.3M	−4.9M to −5.3M	−23 to −25
5311 and 5340 rural	24.2M	22.0 to 23.6M	−546K to −2.2M	−2.3 to −8.9
5307 and 5340 urban	101M	106 to 107M	5.28 to 6.34M	5.2 to 6.3

Table 20 presents more details on the § 5307 program by showing the predicted appropriations for each of the large and small urban areas in Georgia. For each size category, the total national-level appropriation and percent difference in funding is shown to demonstrate how Georgia's urban areas are growing relative to urban areas of comparable size in the U.S. Atlanta is predicted to receive additional § 5307 funding, despite the fact that, overall, the funding needs within this program may decrease. Georgia has also seen explosive growth around the Savannah large urban area, and Tennessee and Georgia have seen dramatic growth in the Chattanooga large urban area. Columbus and

Augusta–Richmond have seen declines and are at risk of losing § 5307 funding, even if the overall funding for this program increases by 23 to 24 percent. A large variation also exists within the small urban areas, with Rome and Cartersville seeing explosive growth; Athens–Clarke, Gainesville, and Warner–Robins experiencing above-average growth; Macon on par with national trends; and Dalton, Brunswick, Hinesville, Valdosta, and Albany showing below-average growth relative to the nation in § 5307. For these latter small urbans, this may come as a surprise, as despite the fact these areas have grown since the 2010 decennial census, they may face cuts in their § 5307 appropriations.

TABLE 20

Funding Outlook for Large and Small Urban Areas in Georgia After 2020 (Assumes FY19 FTA Data Values)

Urban Area (Population Size)	Current Appropriation	Predicted Appropriation	Difference	% Difference
Atlanta	69.1M	74.2 to 74.7M	5.1 to 5.5M	7.4 to 8.0
Avg. 5307 (1M+)	3.38B	3.00 to 3.06B	−316 to −358M	−9 to −11
Savannah	3.5M	13.5 to 13.5M	10.0 to 10.0M	289 to 290
Chattanooga TN–GA	3.6M	13.6 to 13.7M	10.0M to 10.1M	279 to 280
Columbus GA–AL	3.8M	3.58 to 3.61M	−167K to −196K	−4 to −5
Augusta–Richmond	2.6M	2.44 to 2.49M	−142K to −196K	−5 to −7
Avg. 5307 (200K–1M)	839M	1.04 to 1.04B	196M to 205M	23 to 24
Rome	765K	1.94 to 1.96M	1.18 to 1.19M	154 to 156
Cartersville	604K	1.30 to 1.32M	693 to 718K	115 to 119
Athens–Clarke	1.7M	2.85 to 2.94M	1.2 to 1.3M	71 to 75
Gainesville	1.5M	2.44 to 2.45M	901 to 910K	58 to 59
Warner–Robbins	1.7M	2.5M to 2.7M	860K to 1.0M	51 to 62
Macon	1.8M	2.50 to 2.57M	677 to 746K	37 to 41
Dalton	1.0M	1.27 to 1.30M	255 to 283K	25 to 28
Brunswick	631K	763 to 798K	132 to 167K	21 to 26
Hinesville	707K	847 to 854K	140 to 147K	20 to 21
Valdosta	1.02M	1.20 to 1.26M	181 to 233K	18 to 23
Albany	1.2M	1.38 to 1.40M	128 to 147K	10 to 12
Avg. 5307 (50–200K)	402M	550 to 608M	148 to 206M	37 to 51

Note: Does not include the § 5340 growing states portion.

4.3.2 County-Level Funding in Georgia

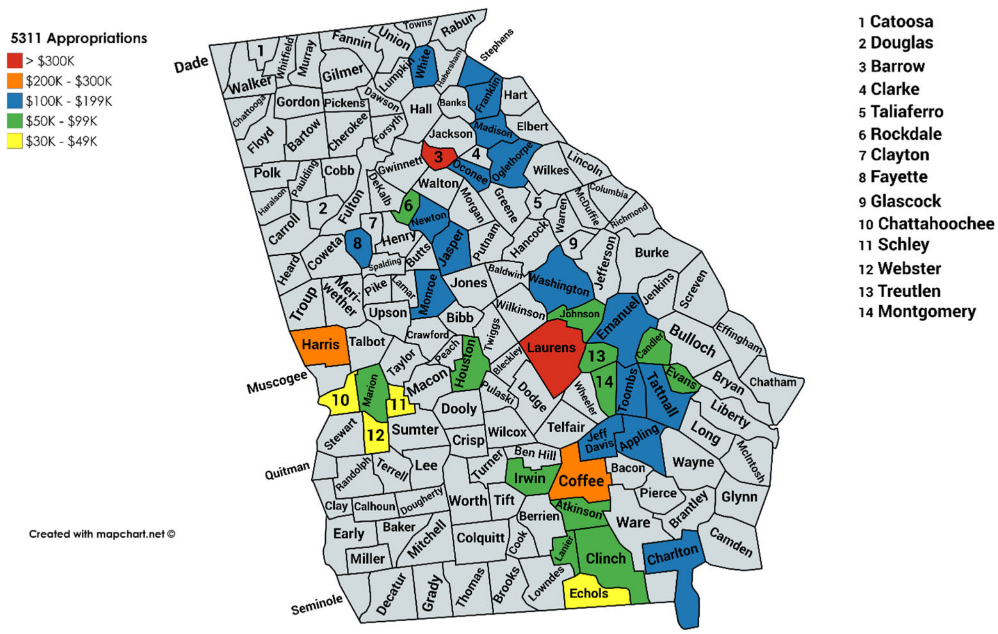
Appendix D, Tables D1–D5 provide information on the current and expected § 5311 and § 5307 levels for every county in Georgia. We can identify counties that currently receive a large amount of appropriated funds through the § 5311 or § 5307 programs, yet do not have transit service for one or both of these programs. This is an indication of strong demand for transit within these counties that is not being met. Table 21 shows the FY19 § 5311 appropriation for counties in Georgia that currently do not have transit service. There are 37 counties in Georgia that currently do not have transit service; of these, 21 receive appropriations of more than $100K. As shown in Figure 19, there is no clear geographic pattern for these counties. The need to start transit service for rural communities is highest in Barrow, Laurens, and Coffee, which currently receive § 5311 appropriations of $357K, $344K, and $290K, respectively.

TABLE 21

FY19 § 5311 Appropriation Levels for Counties That Do Not Have Transit Service

County	FY19 § 5311 Appropriation	County	FY19 § 5311 Appropriation
Barrow	356,850	Stephens	169,326
Laurens	343,592	Washington	162,573
Coffee	290,198	Franklin	150,781
Harris	205,599	Appling	139,727
Newton	199,352	Fayette	116,242
Toombs	190,041	Charlton	110,912
Tattnall	178,355	Oglethorpe	110,363
White	175,914	Jeff Davis	110,267
Emanuel	175,702	Jasper	104,453
Monroe	173,863	Oconee	102,671
Madison	173,755		

Note: Only those counties with appropriations greater than $100K are shown.



Source: Mapchart.net 2019.

FIGURE 19

FY19 § 5311 Appropriation Levels for Counties That Do Not Have Transit Service

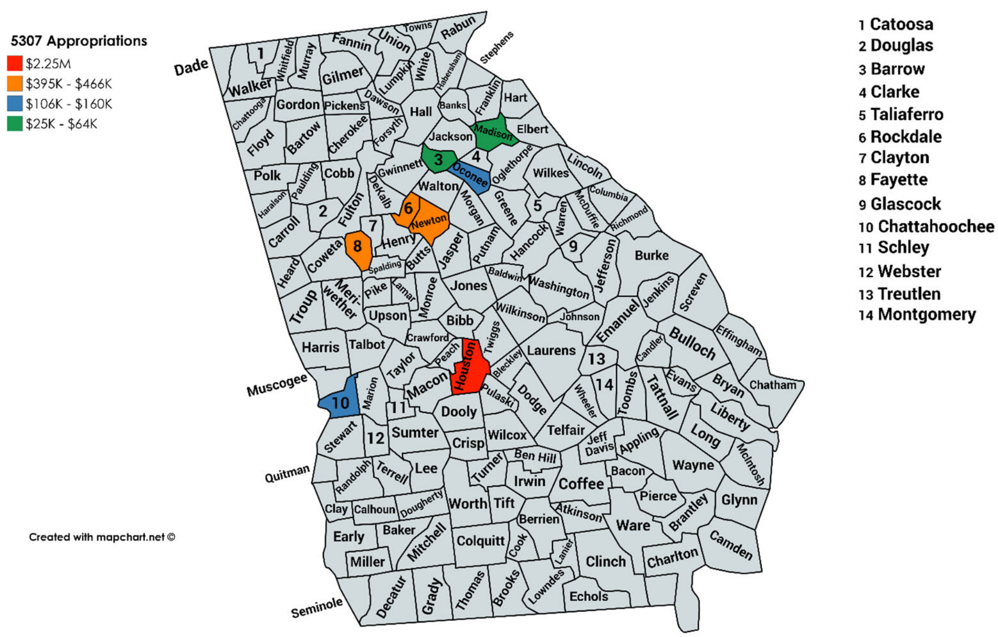
Table 22 and Figure 20 show the FY19 § 5307 appropriation levels for those counties that currently do not have transit service. There are 11 counties in Georgia that receive § 5307 appropriations, but only the six shown in Table 22 receive an appropriation of more than $100K. Among the counties shown in Table 22, Houston is clearly the outlier that is eligible to receive $2.25M from the § 5307 program, and is in arguably a strong position to initiate transit service. Fayette, Rockdale, and Newton also have federal funds of $467K, 456K, and $395K, respectively, that they would be able to receive if they decided to start transit service under the § 5307 program. As shown in Figure 20, Fayette, Rockdale, and Newton are all near the Atlanta metro area.

TABLE 22

FY19 § 5307 Appropriation Levels for Counties That Do Not Have Transit Service

County	FY19 § 5307 Appropriation
Houston	2,250,481
Fayette	466,882
Rockdale	456,127
Newton	395,258
Oconee	160,141
Chattahoochee	106,684

Note: Only those counties with appropriations greater than $100K are shown.

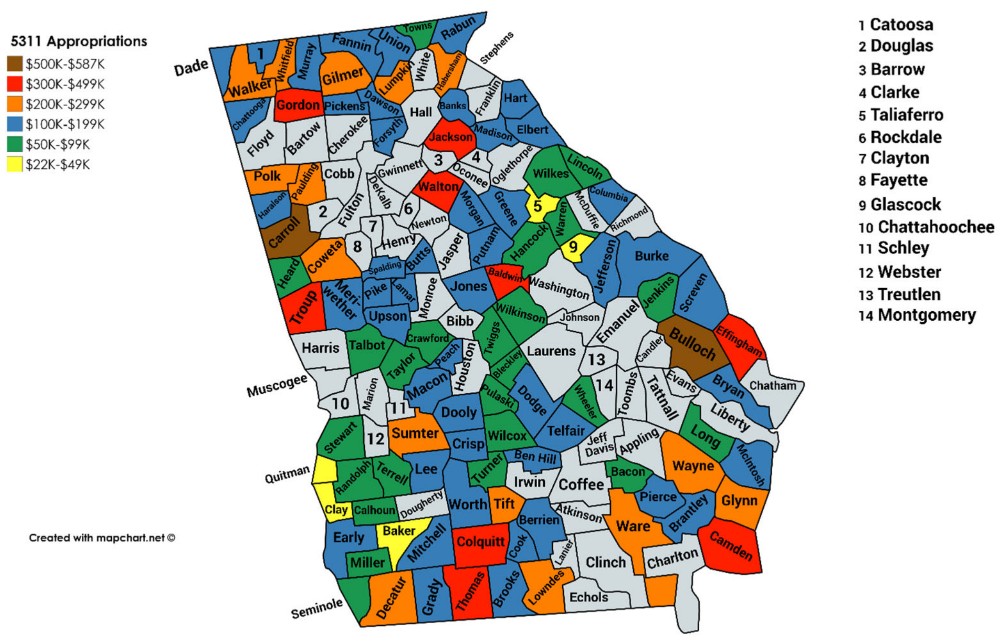


Source: Mapchart.net 2019.

FIGURE 20

FY19 § 5307 Appropriation Levels for Counties That Do Not Have Transit Service

One of the reasons that the counties shown in Table 21 and Table 22 may have not initiated transit service is because of economy of scale issues. That is, there may be a level of funding at which it becomes financially feasible for counties to offer transit service. To investigate whether this may be occurring, Figure 21 shows the FY19 § 5311 appropriation levels for those counties that do offer transit service under the § 5311 program and not the § 5307 program. A wide range of appropriations at the county level are shown in the figure, but the majority of the counties that offer service (either individually or within a multi-county operation) fall in the $100K–$299K range.



Source: Mapchart.net 2019.

FIGURE 21

FY19 § 5311 Appropriation Levels for Counties That Have Only 5311 Transit Service

Table 23 shows the percentage of counties that offer transit service under the § 5311 program among those counties that receive at least $25K annually in FTA § 5311 appropriations. As the appropriation level increases, so does the probability that the county will offer transit service. A total of 60% of counties that have FTA § 5311 appropriations greater than $25K and less than $50K do not offer transit service. This decreases to 34% for those counties that receive between $50K and $100K and to 26% for those counties that receive between $100K and $200K. Above the $200K sample, this percentage levels off at 14% to 15%, suggesting that at above this appropriation threshold other factors other than the subsidy amount may be influencing the county's decision to provide transit.

TABLE 23

Comparison of FY19 § 5311 Appropriation Levels Across Counties

FY19 § 5311 Appropriation	# Counties That Offer § 5311 Transit	# Counties that Do Not Offer § 5311 Transit	% Counties that Do Not Offer § 5311 Transit
25K – 49K	4	6	60%
50K – 99K	25	13	34%
100K – 199K	53	19	26%
200K – 299K	18	3	14%
300K or more	11	2	15%

Table 24 sheds light on the difficulties that counties providing § 5311 service may be facing in transitioning to a mixed transit service based on funding from both the § 5311 and § 5307 programs. The three counties of Lowndes, Whitfield, and Forsyth have § 5307 appropriations of approximately $1M (specifically, $1.1M, $952K, and $922K, respectively). Four counties have funding around $500K, namely Glynn ($668K), Paulding ($649K), Columbia ($615K), and Coweta ($485K). Among these, Glynn County (where Brunswick, GA, is located) has announced plans to start transit service based on § 5307 funds (Brunswick Area Transportation Study 2019). Seven counties in Georgia are eligible for § 5307 funding at the $123K–$270K level and seven counties are eligible for § 5307 funding at the $23K–$66K level.

TABLE 24

FY19 § 5307 Appropriation Levels for Counties That Only Offer § 5311 Transit Service

County	FY19 § 5307 Appropriation	County	FY19 § 5307 Appropriation
Lowndes	1,076,358	Walton	153,032
Whitfield	952,223	Murray	133,565
Forsyth	922,057	Carroll	123,215
Glynn	667,852	Peach	66,984
Paulding	649,216	Bryan	53,704
Columbia	615,924	Jones	53,219
Coweta	485,128	Jackson	41,301
Catoosa	269,716	Long	33,585
Spalding	231,447	Madison	25,064
Walker	183,474	Dawson	22,585
Lee	167,091		

Table 25 provides evidence of the difficulties that counties are facing in initiating transit service based on the § 5307 program. Compared to rural transit, the threshold at which it becomes feasible for counties to offer transit under the urban program appears to be much higher. As seen in Table 25, with the exception of Liberty, all of the counties receive more than $1M in § 5307 appropriations. This suggests that the current regulatory framework to help transit operators in trending urban areas transition from rural to urban funding is not working very well. Simply stated, counties and transit operators are making the decision not to draw down their § 5307 funds until the appropriation level reaches around $1M. This could be because of increased reporting requirements associated with offering joint § 5311 and § 5307 service, or it could be due to the limitations surrounding the use of § 5307 program funds for operating expenses. Understanding why the thresholds for initiating transit service are so distinct between the § 5311 and § 5307 programs in Georgia would be an interesting direction for future research.

TABLE 25

FY19 § 5307 Appropriation Levels for Counties That Only Offer § 5307 Transit Service

County	FY19 § 5307 Appropriation	County	FY19 § 5307 Appropriation
Fulton	25,680,194	Hall	2,194,364
DeKalb	19,785,158	Floyd	1,861,312
Clayton	7,268,028	Richmond	1,702,365
Gwinnett	6,621,237	Henry	1,231,829
Cobb	6,500,720	Bartow	1,220,368
Chatham	3,646,778	Cherokee	1,185,905
Muscogee	3,541,921	Dougherty	1,172,357
Bibb	2,412,707	Douglas	1,134,652
Clarke	2,391,818	Liberty	723,315

4.4 Summary

The potential impacts on transit throughout the nation hinge more on the overall appropriation levels that will be targeted to each system type, rather than the disruptions that will be caused from the high-risk transitions of rural transit systems into large urban areas. However, future authorizations and legislations can address both of these core issues by looking closely at how authorization levels should be set and by eliminating and/or adapting the 100 bus rule to allow for current § 5311 VRH to be used in place of § 5307 VRH. Eliminating the 100 bus rule and simply allowing small systems operating within large urban areas to use FTA § 5307 funds toward operating costs would provide the smoothest transition for these high-risk systems and enable them to continue operations with minimal disruptions—that is, there would be no two-year gap in funding and systems could continue to apply the same level of FTA funding toward operating expenses. Alternatively, allowing § 5311 VRH to be used as part of the 100 bus rule will effectively eliminate the two-year gap in the use of § 5307 funds for operating expenses, but would reduce the amount of FTA funding that can be applied toward operating expenses. The level of operating funding could be maintained by applying a factor to the § 5311 VRH in the current formula[4].

In addition, we recommend that future authorizations explore ways in which subrecipients in areas trending urban can more seamlessly transition to the § 5307 program. Our analysis of Georgia shows that many subrecipients are not making this transition until the § 5307 appropriation reaches $1M. A possible alternative to the 100 bus rule would be to allow subrecipients with § 5307 appropriations of less than $1M to use those funds toward operating expenses..

[4] Determining this factor is outside the scope of the study. However, the basic idea is the following: to calculate the percent of funds that can be used for operating as *FACTOR* × 5311 VRM / TOTAL 5307 VRM for the large urban area, where the *FACTOR* is a number greater than 1.

5 FINDINGS AND RECOMMENDATIONS

5.1 Findings

This report predicted changes in funding for the FTA § 5311 and § 5307 programs through modeling spatial and temporal changes in the U.S. population between 2010 and 2020. We used this model to identify—both for Georgia and the nation—non-urbanized areas that have a high probability of being reclassified as small urban areas and/or of being absorbed into small urban or large urban areas after the 2020 decennial census. This list will be particularly helpful for states and the Federal Transit Administration for identifying transit systems that are at high risk of losing the ability to use their FTA funding for operating expenses after the 2020 decennial census due to being absorbed into large areas.

As part of the analysis, we used the predictions from our binary logit models, along with current service data available from the National Transit Database and FTA's Data Value Table (colloquially referred to as "Table 5") to predict if and how the funding needs of rural, small urban, and large urban areas would change after the 2020 decennial census. Our results show a dramatic need for increased funding for small urban areas and large urban areas with populations under 1M. While our analysis shows that the "funding needs" of rural systems would theoretically decrease after the decennial census, we are not advocating for a decrease in the FTA § 5311 appropriation for non-urbanized/rural systems. Rural transit systems are predominately demand-responsive systems that operate in low-density areas, often transporting individuals over long distances to connect to urban centers with medical and other facilities. The ability to sustain transit systems in these low-density and often isolated rural areas is contingent on appropriation levels remaining at the same or similar level as today.

Another key finding from our research is that the 100 bus rule, while designed to provide some flexibility for small systems operating within a large urban area, will likely cause problems for small systems located close to large urban areas after the 2020 decennial census. This has two underlying causes. First, the appropriation language requires that to qualify to use § 5307 urban funds for operating expenses, small systems must compare their vehicle revenue hours of service certified under the § 5307 program to the vehicle revenue hours of the entire large urban area to which they belong. This effectively creates a two-year gap in operating funding for these systems, as they would not be able to start § 5307 service until after the 2020 decennial census and then would have to wait two years to have their data certified and used in the appropriation formula. Second, because the vehicle revenue hours of the majority of small transit systems are miniscule compared to the large urban transit operator, the 100 bus rule effectively reduces the amount of FTA funding these systems will be able to use toward their operating expenses in years three and beyond.

Our analysis shows that the overall needs in transit funding by system size will be different in 2020 than they were in 2010. As with any analysis, there are limitations. Many assumptions went into this analysis, and replicating the funding allocation process and the 100 bus rule was quite challenging. Our analysis is robust, though, in the sense that the general funding needs hold across a conservative and aggressive planning scenario. It is our hope that the results of our analysis will be used to help influence future appropriation discussions and to help Georgia and other states identify areas of the nation that are trending urban and at risk for sustaining transit service after the decennial census

5.2 Recommendations

Based on our analysis, we offer the following recommendations for future appropriations for the FTA § 5311 and § 5307 programs:

- Maintain current appropriation levels for the § 5311 program.
- Significantly increase appropriation levels for the § 5307 program on the order of $344M–$411M per year and direct this increase in funding to small urban systems and large urban systems serving populations less than 1M.
- Provide small transit systems with more flexibility of using FTA funds for operating expenses that do not depend on whether these small transit systems serve rural, small urban areas, or large urban areas. One possibility is to allow the use of § 5307 towards operating expenses for those systems that receive § 5307 appropriations of less than $1M.
- If the 100 bus rule continues as part of future legislation, then allowing small transit systems that are transitioning to § 5307 service to use their § 5311 vehicle revenue miles as part of future appropriations would eliminate the "two year gap" in funding that these systems currently face.
- Sunset the 100 bus rule and tie the definition of "small" transit systems to a different metric, such as vehicle revenue hours. Given the advances in incorporating transportation networking companies (such as Uber and Lyft) into public

transportation offerings, the 100 bus rule can arguably result in transit systems not pursuing innovative solutions for fear of losing operating revenues.

REFERENCES

Atlanta Regional Commission (ARC). (2018). *Regional Transit Policy for FTA Urbanized Area Formula Fund Section 5307/Section 5340.* Retrieved from https://atlantaregional.org/wp-content/uploads/fta-formula-fund-regional-transit-policies-section-5307-2018.pdf.

Boustan, L.P., Bunten, D., Hearey, O. (2013). Urbanization in the United States, 1800–2000 (Working Paper). Retrieved from https://scholar.princeton.edu/sites/default/files/lboustan/files/research21_urban_handbook.pdf.

Brunswick Area Transportation Study (2019). *The Brunswick Transportation Study's Unified Planning Work Program: FY 2020 Draft.* Available online at https://www.glynncounty.org/DocumentCenter/View/61729/Draft-BATS-FY-2020-UPWP.

Environmental Systems Research Institute (ESRI). (2017). ArcGIS Release 10.5.1. Redlands, California.

Environmental Systems Research Institute (ESRI). (2015). 2015/2020 Population Projections. Available online at https://doc.arcgis.com/en/esri-demographics/data/updated-demographics.htm.

Federal Register. (2011). Urban Area Criteria for Census – 2000 Proposed Criteria. 76 Fed. Reg. 53032-53034 (August 24, 2011). Retrieved from https://www2.census.gov/geo/pdfs/reference/fedreg/fedregv76n164.pdf.

Federal Register. (2012). Small Transit Intensive Cities Program. Available online https://books.google.com/books?id=lHPvSk4p9g0C&pg=PA63683#v=onepage&q&f=false. Accessed November 5, 2019.

Federal Register. (2019). FTA Fiscal Year 2019 Apportionments, Allocations and Program Information. A Notice by the Federal Transit Administration on 07/03/2019. Available online at https://www.federalregister.gov/documents/2019/07/03/2019-14248/fta-fiscal-year-2019-apportionments-allocations-and-program-information. Accessed October 12, 2019.

Federal Transit Administration (FTA). (n.d. (a)). Grant Programs. Retrieved from https://www.transit.dot.gov/grants.

Federal Transit Administration (FTA). (n.d. (b)). Rural Transportation Assistance Program – 5311(b)(3). Retrieved from https://www.transit.dot.gov/funding/grants/rural-transportation-assistance-program-5311b3.

Federal Transit Administration (FTA). (2015). Census 2010 and FTA Formula Grants. Retrieved from https://www.transit.dot.gov/sites/fta.dot.gov/files/Census%202010%20and%20FTA%20Formula%20Grants%2012-7-15.pdf.

Federal Transit Administration (FTA). (2016). Metropolitan Planning Organization (MPO): Overview. Retrieved from https://www.transit.dot.gov/regulations-and-guidance/transportation-planning/metropolitan-planning-organization-mpo.

Federal Transit Administration (FTA). (2017). National Transit Database: Policy Manual. Office of Budget and Policy. Retrieved from https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/ntd/57981/2017-ntd-policy-manual_2.pdf.

Federal Transit Administration (FTA). (2018). FY18 Comprehensive Review Guide: 20. Section 5311 Program Requirements. Retrieved from https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/regulations-and-guidance/safety/triennial-reviews/69531/fy18-comprehensive-review-guide-section-20-section-5311-program-requirements.pdf.

Federal Transit Administration (FTA). (2019a). Census Data on Rural Population and Land Area (Used for the Section 5311 Rural Area Formula Apportionments). Available online at https://www.transit.dot.gov/funding/apportionments/census-data-rural-population-and-land-area-used-section-5311-rural-area. Accessed for FY19 on September 24, 2019.

Federal Transit Administration (FTA). (2019b). Census Low Income Population Data (Used for the Section 5307 and 5311 Apportionments). Available online at https://www.transit.dot.gov/funding/apportionments/census-low-income-population-data-used-section-5307-and-5311-apportionments. Accessed for FY19 on September 24, 2019.

Federal Transit Administration (FTA). (2019c). Census Urbanized Area Population and Population Density Data (Used for the Section 5303, 5305, and 5307 Apportionments). Available online at https://www.transit.dot.gov/funding/apportionments/census-urbanized-area-population-and-population-density-data-used-section. Accessed for FY19 on September 24, 2019.

Federal Transit Administration (FTA). (2019d). National Transit Database Data Used for the Section 5307 Urbanized Area Formula and Section 5339 Bus Formula Apportionments. Available online at https://www.transit.dot.gov/funding/apportionments/national-transit-database-data-used-section-5307-urbanized-area-formula-and. Accessed for FY19 on September 24, 2019.

Federal Transit Administration (FTA). (2019e). National Transit Database Data Used for the Section 5311 Apportionments. Available online at https://www.transit.dot.gov/funding/apportionments/national-transit-database-data-used-section-5311-apportionments. Accessed for FY19 on September 24, 2019.

Federal Transit Administration (FTA). (2019f). National Transit Database Data Used for the Small Transit Intensive Cities (STIC) Apportionments. Available online at https://www.transit.dot.gov/funding/apportionments/national-transit-database-data-used-small-transit-intensive-cities-stic. Accessed for FY19 on September 24, 2019.

Federal Transit Administration (FTA). (2019g). National Transit Database and Census Data Used for the Tribal Transit Apportionments. Available online at https://www.transit.dot.gov/funding/apportionments/national-transit-database-and-census-data-used-tribal-transit-apportionments. Accessed for FY19 on September 24, 2019.

Federal Transit Administration (FTA). (2019h). Section 5307 Urbanized Area Formula Program. Available online at: https://www.transit.dot.gov/funding/apportionments/section-5307-urbanized-area-formula-program. Accessed September 24, 2019.

Federal Transit Administration (FTA). (2019i). Section 5311 Rural Formula Program. Available online at https://www.transit.dot.gov/funding/apportionments/section-5311-rural-formula-program. Accessed September 24, 2019.

Federal Transit Administration (FTA). (2019j). Table 3A: FY 2019 Section 5307 Operating Assistance Special Rule Operator Caps (Full Year). Available online at https://www.transit.dot.gov/funding/apportionments/table-3a-fy-2019-section-5307-operating-assistance-special-rule-operator-caps. Accessed for FY19 on September 24, 2019.

Green, J., and Mahomoui, D. (2017). lehdr: Grab LEHD Flat Files. R package. Retrieved from https://rdrr.io/github/jamgreen/lehdR/.

Kuhn, M., Wing, J., Weston, S., Williams, A., Keefer, C., Engelhardt, A., Cooper, T., Mayer, Z., Kenkel, B., the R Core Team, Benesty, M., Lescarbeau, R., Ziem, A., Scrucca, L.,Tang, Y., Candan, C., and Hunt, H. (2018). caret: Classification and Regression Training. R package version 6.0-80. Retrieved from https://CRAN.R-project.org/package=caret.

Long, J.A. (2018). jtools: Analysis and Presentation of Social Scientific Data. R package version 1.0.0. Retrieved from https://cran.r-project.org/package=jtools.

Manson, S., Schroeder, J., Van Riper, D. and Rulles, S. (2019). IPUMS National Historical Geographic Information System: Version 14.0. Minneapolis, MN: IPUMS. Available at: https://www.nhgis.org/user-resources/geographic-crosswalks.

Mapchart.net (2019). Online GIS tool. Available at: https://mapchart.net/.

Pebesma, E. (2018). sf: Simple Features for R. R package version 0.6-3. Retrieved from https://CRAN.R-project.org/package=sf.

R Core Team. (2018). The R Project for Statistical Computing. Vienna, Austria. Retrieved from https://www.R-project.org/.

Ratcliffe, M., Burd, C., Holder, K., and Fields, A. (2016). Defining Rural at the U.S. Census Bureau: American Community Survey and Geography Brief. Retrieved from https://www2.census.gov/geo/pdfs/reference/ua/Defining_Rural.pdf.

Smith, S. K., Tayman, J., Swanson, D. A. (2001). State and Local Population Projections, Methodology and Analysis. New York, NY: Kluwer Academic/Plenum Publishers.

Stapel, E. (2012). Exponential Functions: Compound Interest. Retrieved from https://www.purplemath.com/modules/expofcns4.htm.

UCLA, Institute for Digital Research and Education. (2011). FAQ: What Are Pseudo R-squareds? Retrieved from https://stats.idre.ucla.edu/other/mult-pkg/faq/general/faq-what-are-pseudo-r-squareds/.

U.S. Bureau of Economic Analysis (BEA). (2017). "SA25N Total Full-Time and Part-Time Employment by NAICs Industry 1." Retrieved from https://apps.bea.gov/.

U.S. Census Bureau. (2001). Census 2000 Summary File 1, United States. Prepared by NHGIS: https://www.nhgis.org.

U.S. Census Bureau. (2010). U.S. Census Bureau. 2010 Population Estimates. Prepared by Social Explorer: http://www.socialexplorer.com.

U.S. Census Bureau. (2011a). Census 2010 Summary File 1, United States. Prepared by NHGIS: https://www.nhgis.org.

U.S. Census Bureau. (2011b). Population Distribution and Change: 2000 to 2010. Retrieved from https://www.census.gov/prod/cen2010/briefs/c2010br-01.pdf.

U.S. Census Bureau. (2015). 2010 Census Tallies of Census Tracts, Block Groups & Blocks. Retrieved from https://www.census.gov/geographies/reference-files/time-series/geo/tallies.html#par_textimage_1.

U.S. Census Bureau. (2017). TIGER/Line Shapefiles. Retrieved from https://www.census.gov/geo/maps-data/data/tiger-line.html

Walker, K. (2018). tigris: Load Census TIGER/Line Shapefiles. R package version 0.7. https://github.com/walkerke/tigris.

Wickham, H. (2018). stringr: Simple, Consistent Wrappers for Common String Operations. R package version 1.3.1. Retrieved from https://CRAN.R-project.org/package=stringr.

Wickham, H., François, R., Henry, L., and Müller, K. (2018). dplyr: A Grammar of Data Manipulation. R package version 0.7.5. Retrieved from https://CRAN.R-project.org/package=dplyr.

Wickham, H., Hester, J., and Chang, W. (2018). devtools: Tools to Make Developing R Packages Easier. R package version 1.13.5. Retrieved from https://CRAN.R-project.org/package=devtools.

APPENDIX A: STATE BINARY LOGIT MODELS

This appendix reports the binary logit models for each state that we estimated to predict whether an area would be rural or urban after the 2020 decennial census.

TABLE A1

Binary Logit Results

	Alabama		Alaska		Arizona		Arkansas		California		Colorado	
	β	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat
Urban (UC or UA in 2000)	6.25	191.1	8.06	51.6	6.31	181.2	8.91	78.9	7.65	211.0	7.68	148.0
Closest urban is an urbanized area	1.24	65.5	0.66	9.78	1.7	78.2	0.82	31.1	1.41	90.5	1.18	48.9
Rural and (0,1] miles from UA	3.56	113.8	5.62	36.3	3.75	119.9	6.27	55.8	4.46	124.7	5.11	102.5
Rural and (1,2] miles from UA	2.01	49.9	3.67	20.1	2.28	56.5	4.59	39.1	2.67	65.7	3.70	65.1
Rural and (2,4] miles from UA	1.49	38.3	3.38	18.0	1.05	25.1	3.23	26.6	1.25	26.7	2.94	51.5
Log of distance to roads	-1.31	-60.1	-	-	-	-	-0.80	-18.9	-0.97	-64.9	-1.09	-34.7
Log of number of jobs in tract	0.34	41.4	0.06	2.56	0.08	11.1	0.25	19.4	0.24	41.3	0.07	6.71
2010 pop den (0,500] (ref.) PSQM*	-	-	-	-	-	-	-	-	-	-	-	-
2010 pop den (500,1000] PSQM*	1.71	49.1	1.96	16.4	2.35	52.3	1.84	36.0	2.24	63.8	2.01	36.8
2010 pop den (1000,2000] PSQM*	1.91	54.0	2.04**	23.8	2.77	62.7	2.00	38.2	2.55	64.2	2.50	42.5
2010 pop den (2000,4000] PSQM*	2.33	59.7	2.04**	23.8	3.18	72.0	2.51	43.5	3.20	76.5	2.96	51.6
2010 pop den of 4000+ PSQM*	2.30	49.1	2.04**	23.8	4.33	111.5	3.09	45.1	4.31	133.1	3.95	80.3
Constant	-6.64	-102.3	-6.96	-32.5	-5.48	-111.1	-9.05	-64.0	-7.29	-131.8	-6.15	-73.0
R^2	0.73		0.80		0.81		0.80		0.84		0.81	
Accuracy	0.9291		0.9545		0.9479		0.9527		0.9613		0.9479	
	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes
Actual No	128,800	9,068	18,428	765	126,038	6,059	119,589	4,921	230,917	13,104	96,359	5,245
Actual Yes	7,670	90,576	460	7,267	6,333	99,534	3,284	45,652	13,670	433,755	5,012	88,021

*Population density in persons per square mile. **For Alaska, population categories estimated for (500,1000] and 1000+ PSQM.

TABLE A1

Binary Logit Results (Continued)

	Connecticut		Delaware		Florida		Georgia		Hawaii		Idaho	
	β	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat
Urban (UC or UA in 2000)	7.71	33.2	6.55	41.0	6.71	230.	6.03	192.	4.29	57.9	6.86	124.
Closest urban is an urbanized area	0.88	15.7	0.25	4.42	0.85	57.7	1.40	74.6	2.04	30.9	1.19	35.5
Rural and (0,1] miles from UA	4.20	18.1	3.97	25.8	3.83	142.	3.22	108.	1.85	25.2	4.17	79.7
Rural and (1,2] miles from UA	2.21	9.10	2.65	16.4	2.75	91.5	1.45	36.6	-	-	2.15	29.6
Rural and (2,4] miles from UA	1.61	6.42	1.72	10.8	1.97	63.1	0.65	15.4	-	-	1.72	25.8
Log of distance to roads	-1.90	-24.7	-1.85	-20.4	-0.49	-33.8	-1.43	-50.5	-	-	-0.94	-24.0
Log of number of jobs in tract	0.18	9.61	0.11	4.48	0.02	3.44	0.45	51.0	0.33	17.4	0.47	25.0
2010 pop den (0,500] (ref.) PSQM*	-	-	-	-	-	-	-	-	-	-	-	-
2010 pop den (500,1000] PSQM*	2.21	31.3	1.86	17.8	2.01	74.4	2.08	62.9	3.02	26.2	1.88	27.0
2010 pop den (1000,2000] PSQM*	2.35	28.0	2.12	22.1	2.32	83.1	2.31	68.1	3.19	24.1	2.05	31.4
2010 pop den (2000,4000] PSQM*	2.78	26.9	2.78	24.9	2.60	84.3	2.89	72.1	3.24	21.9	2.60	42.4
2010 pop den of 4000+ PSQM*	3.07	29.4	2.87	25.5	2.83	90.5	3.11	61.7	3.30	29.5	3.37	59.6
Constant	-6.90	-25.9	-4.46	-20.3	-4.40	-96.5	-7.25	-106.	-5.82	-40.8	-8.63	-59.8
R^2	0.72		0.62		0.72		0.77		0.70		0.81	
Accuracy	0.9455		0.9033		0.9347		0.9382		0.9393		0.9618	
	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes
Actual No	12,954	1,817	5,263	1,067	102,550	13,725	134,275	9,472	189,623	12,103	106,125	3,183
Actual Yes	1,663	47,425	1,181	15,737	15,997	322,735	7,301	120,234	10,129	154,287	2,238	30,188

*Population density in persons per square mile.

TABLE A1

Binary Logit Results (Continued)

	Illinois		Indiana		Iowa		Kansas		Kentucky		Louisiana	
	β	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat
Urban (UC or UA in 2000)	8.54	147.	9.11	91.9	8.93	125	8.46	149.	8.27	86.7	8.27	110.
Closest urban is an urbanized area	1.57	87.3	1.38	66.2	1.29	41.9	1.28	40.6	1.13	39.4	1.15	49.2
Rural and (0,1] miles from UA	5.58	95.2	6.11	61.4	5.92	81.0	5.42	95.4	5.83	61.3	5.22	69.9
Rural and (1,2] miles from UA	3.31	49.1	4.14	39.7	3.73	41.0	3.04	39.4	3.71	35.7	3.40	41.5
Rural and (2,4] miles from UA	2.58	40.0	2.78	26.3	2.75	31.6	2.15	27.4	2.95	28.2	2.82	35.0
Log of distance to roads	-1.28	-47.4	-0.51	-16.0	-1.19	-26.8	-0.92	-24.7	-1.41	-22.9	-1.73	-37.2
Log of number of jobs in tract	0.29	35.7	0.33	33.4	0.50	31.1	0.37	25.1	0.28	26.8	0.32	33.3
2010 pop den (0,500] (ref.) PSQM*	-	-	-	-	-	-	-	-	-	-	-	-
2010 pop den (500,1000] PSQM*	1.85	40.0	1.89	39.0	1.97	24.4	1.73	24.1	1.69	30.8	1.89	37.0
2010 pop den (1000,2000] PSQM*	1.91	46.9	1.97**	64.3	2.30	30.0	2.09	32.2	1.88	34.8	2.09	39.2
2010 pop den (2000,4000] PSQM*	2.09	59.3	1.97**	64.3	2.56	40.2	2.61	44.5	2.10	37.2	2.39	41.3
2010 pop den of 4000+ PSQM*	3.06	85.2	2.62	67.2	3.17	49.9	3.34	53.3	2.79	44.1	2.78	48.2
Constant	-8.55	-107.	-9.87	-81.4	-10.5	-77.8	-8.86	-74.9	-8.55	-72.0	-8.15	-82.7
R^2	0.83		0.81		0.87		0.86		0.79		0.79	
Accuracy	0.9571		0.9519		0.9685		0.9691		0.9422		0.9444	
	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes
Actual No	163,511	7,834	122,674	6,123	149,019	3,557	165,547	4,275	86,571	4,423	89,115	5,579
Actual Yes	10,875	254,053	6,353	124,278	3,081	55,193	2,870	58,558	3,987	50,402	4,962	89,906

*Population density in persons per square mile. **For Indiana, one coefficient was estimated for (1000,4000] PSQM.

TABLE A1

Binary Logit Results (Continued)

	Maine		Maryland		Massachusetts		Michigan		Minnesota		Mississippi	
	β	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat
Urban (UC or UA in 2000)	7.21	70.3	6.72	113.	6.69	58.7	7.30	153.	7.07	168.	7.37	113.
Closest urban is an urbanized area	1.02	19.0	1.15	40.9	0.96	25.8	1.36	62.0	1.18	41.5	1.75	58.4
Rural and (0,1] miles from UA	4.17	40.2	3.26	56.2	3.36	29.4	4.26	88.4	4.25	107.	4.87	74.3
Rural and (1,2] miles from UA	1.71	11.0	0.93	12.4	1.41	11.1	2.29	38.2	1.78	28.4	3.07	39.8
Rural and (2,4] miles from UA	-	-	0.92	13.3	0.96	6.94	1.60	27.3	0.29	3.57	2.23	28.0
Log of distance to roads	-	-	-1.70	-36.7	-1.04	-31.1	-1.02	-40.8	-0.98	-28.1	-0.99	-25.8
Log of number of jobs in tract	0.85	28.9	0.27	23.4	0.36	27.2	0.23	26.6	0.56	42.2	0.43	35.9
2010 pop den (0,500] (ref.) PSQM*	-	-	-	-	-	-	-	-	-	-	-	-
2010 pop den (500,1000] PSQM*	1.45	15.1	1.36	24.4	1.77	30.9	1.89	43.0	2.00	35.7	1.61	30.5
2010 pop den (1000,2000] PSQM*	1.57	14.9	1.47	24.8	1.96**	42.3	1.96	44.7	2.20	40.9	1.68	32.3
2010 pop den (2000,4000] PSQM*	1.95	18.0	1.84	32.3	1.96**	42.3	2.23	54.0	2.64	56.5	2.27	41.3
2010 pop den of 4000+ PSQM*	2.07	21.1	2.17	47.8	2.78	43.0	3.09	67.7	3.25	70.5	2.37	41.4
Constant	-12.2	-51.7	-6.11	-61.9	-7.12	-49.3	-6.97	-93.3	-8.95	-86.9	-9.02	-84.8
R^2	0.83		0.75		0.68		0.84		0.84		0.76	
Accuracy	0.9681		0.9427		0.9445		0.9610		0.9632		0.9443	
	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes
Actual No	48,157	920	40,921	4,125	21,692	4,108	151,263	5,995	153,597	5,487	115,251	4,440
Actual Yes	1,054	11,837	3,702	87,780	3,886	114,242	5,945	143,238	3,381	78,193	4,771	40,989

*Population density in persons per square mile. **For Massachusetts, one coefficient was estimated for (1000,4000] PSQM.

TABLE A1

Binary Logit Results (Continued)

	Missouri		Montana		Nebraska		Nevada		New Hampshire		New Jersey	
	β	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat
Urban (UC or UA in 2000)	6.64	197.	11.6	45.6	8.40	126.	7.94	83.7	5.64	88.0	6.54	59.0
Closest urban is an urbanized area	1.62	76.2	0.95	16.3	1.80	43.1	2.08	47.4	1.36	30.2	1.25	29.6
Rural and (0,1] miles from UA	3.71	113.	8.58	34.0	5.84	86.9	5.53	62.1	2.81	44.7	3.05	27.5
Rural and (1,2] miles from UA	1.61	32.2	6.80	25.8	3.62	43.2	3.91	39.7	0.79	7.74	1.14	9.24
Rural and (2,4] miles from UA	0.50	8.82	6.05	23.4	1.42	11.2	2.45	23.3	-	-	0.29	2.19
Log of distance to roads	-1.11	-37.9	-1.91	-26.2	-1.16	-20.2	-0.68	-13.8	-	-	-0.69	-22.0
Log of number of jobs in tract	0.43	42.2	0.36	12.2	0.22	11.9	-	-	0.65	27.4	0.18	14.6
2010 pop den (0,500] (ref.) PSQM*	-	-	-	-	-	-	-	-	-	-	-	-
2010 pop den (500,1000] PSQM*	1.75	39.0	2.16	19.6	1.28	13.8	2.71	27.6	1.48	20.7	1.99	31.3
2010 pop den (1000,2000] PSQM*	1.88	44.6	2.62	23.2	1.77	22.0	2.53	24.9	1.53	19.4	2.24	34.4
2010 pop den (2000,4000] PSQM*	2.21	57.4	3.12	26.7	2.09	30.6	2.57	27.4	2.22	23.5	2.74	40.6
2010 pop den of 4000+ PSQM*	2.69	66.3	3.73	29.5	2.98	43.5	4.20	48.1	2.45	28.0	3.77	51.0
Constant	-7.80	-99.7	-11.6	-36.4	-7.89	-53.9	-6.40	-71.8	-9.21	-50.2	-5.99	-40.4
R^2	0.82		0.90		0.87		0.86		0.74		0.73	
Accuracy	0.9570		0.9815		0.9712		0.9615		0.9352		0.9588	
	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes
Actual No	200,021	7,827	103,663	1,412	139,536	3,253	47,357	1,526	26,538	1,555	20,596	3,753
Actual Yes	6,115	109,947	923	20,061	2,156	42,910	1,689	32,937	1,353	15,441	2,824	132,617

*Population density in persons per square mile.

TABLE A1

Binary Logit Results (Continued)

	New Mexico		New York		North Carolina		North Dakota		Ohio		Oklahoma	
	β	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat
Urban (UC or UA in 2000)	8.77	76.4	6.97	163.	5.91	207.	11.3	50.1	8.49	122.	7.64	158.
Closest urban is an urbanized area	0.90	28.1	1.28	64.6	1.09	69.1	0.77	12.6	1.34	76.5	1.66	60.6
Rural and (0,1] miles from UA	6.06	52.7	3.55	82.5	3.29	121.	8.34	37.3	5.46	78.4	4.79	98.5
Rural and (1,2] miles from UA	4.10	32.9	1.91	36.4	1.80	53.6	5.89	24.9	3.18	42.2	2.32	33.9
Rural and (2,4] miles from UA	2.20	14.2	1.12	20.9	1.19	36.0	4.83	19.9	2.39	32.2	1.82	27.4
Log of distance to roads	-0.63	-16.5	-0.92	-30.8	-0.90	-41.9	-1.09	-12.7	-1.16	-38.6	-1.15	-32.2
Log of number of jobs in tract	0.25	23.2	0.14	17.3	0.30	42.3	0.57	19.0	0.36	43.6	0.31	27.5
2010 pop den (0,500] (ref.) PSQM*	-	-	-	-	-	-	-	-	-	-	-	-
2010 pop den (500,1000] PSQM*	2.12	33.9	1.67	44.7	1.86	70.1	1.82	11.4	1.80	46.0	1.92	36.4
2010 pop den (1000,2000] PSQM*	2.44	35.8	1.88	45.9	2.13	78.0	2.40	13.8	2.09	53.1	2.13**	60.1
2010 pop den (2000,4000] PSQM*	2.64	35.8	2.23	53.5	2.55	81.0	2.89	16.6	2.41	66.4	2.13**	60.1
2010 pop den of 4000+ PSQM*	3.33	48.4	2.86	78.3	3.01	76.2	3.75	21.4	2.80	85.6	2.72	56.2
Constant	-8.95	-65.9	-6.26	-88.8	-6.26	-109.	-13.0	-42.4	-9.32	-103.	-7.96	-88.7
R^2	0.84		0.82		0.70		0.90		0.80		0.82	
Accuracy	0.9633		0.9581		0.9151		0.9857		0.9473		0.9597	
	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes
Actual No	119,250	3,143	137,533	8,283	127,932	13,084	114,095	910	153,970	9,497	170,521	5,333
Actual Yes	2,949	40,717	5,819	185,103	10,270	123,842	931	13,128	9,029	179,090	4,945	74,375

*Population density in persons per square mile. **For Oklahoma, one coefficient was estimated for (1000,4000] PSQM.

TABLE A1

Binary Logit Results (Continued)

	Oregon		Pennsylvania		Rhode Island		South Carolina		South Dakota		Tennessee	
	β	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat
Urban (UC or UA in 2000)	7.47	120.	6.86	198.	0.64	4.86	6.62	148.	8.16	81.8	6.42	169.
Closest urban is an urbanized area	1.25	39.1	0.88	53.9	8.96	25.8	1.53	67.2	1.43	24.6	1.36	68.1
Rural and (0,1] miles from UA	4.70	75.2	3.58	104.	5.16	14.9	3.84	88.2	5.78	59.4	3.63	98.9
Rural and (1,2] miles from UA	2.73	33.4	1.91	46.6	-	-	2.45	48.5	3.76	29.5	1.91	42.1
Rural and (2,4] miles from UA	1.27	13.7	0.57	13.1	-	-	1.53	29.5	3.26	27.5	1.08	22.7
Log of distance to roads	-1.54	-36.6	-1.47	-53.4	-1.52	-10.5	-1.15	-34.6	-0.96	-12.0	-1.38	-43.1
Log of number of jobs in tract	0.59	34.9	0.18	23.4	0.36	8.45	0.33	31.7	0.15	6.85	0.33	46.2
2010 pop den (0,500] (ref.) PSQM*	-	-	-	-	-	-	-	-	-	-	-	-
2010 pop den (500,1000] PSQM*	2.46	38.1	1.98	63.7	1.54	8.23	1.83	47.3	1.72	13.9	1.83	51.1
2010 pop den (1000,2000] PSQM*	2.75	37.8	2.10	65.8	1.55**	11.2	1.92	48.8	1.82	16.2	2.26	58.7
2010 pop den (2000,4000] PSQM*	3.02	41.0	2.37	74.7	1.55**	11.2	2.36	50.7	2.50	25.2	2.77	63.3
2010 pop den of 4000+ PSQM*	3.70	60.2	2.80	99.7	3.09	13.2	2.89	49.8	3.51	32.7	3.31	59.9
Constant	-9.77	-72.8	-6.04	-98.6	-8.43	-18.6	-7.27	-86.5	-7.55	-42.5	-6.98	-113.
R^2	0.87		0.79		0.79		0.75		0.85		0.77	
Accuracy	0.9683		0.9475		0.9696		0.9332		0.9751		0.9373	
	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes
Actual No	119,520	3,103	156,942	12,648	2,829	345	84,039	5,719	70,916	1,196	127,792	8,205
Actual Yes	2,970	65,989	8,668	227,764	363	19,789	5,763	76,422	920	11,851	6,947	92,005

*Population density in persons per square mile. **For Rhode Island, one coefficient was estimated for (1000,4000] PSQM.

TABLE A1

Binary Logit Results (Continued)

	Texas		Utah		Vermont		Virginia		Washington		West Virginia	
	β	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat	***β***	t-stat
Urban (UC or UA in 2000)	7.11	311.	6.63	103.	8.18	42.4	6.84	176.	6.82	152.	7.17	113.
Closest urban is an urbanized area	1.68	144.	1.48	41.6	1.39	14.4	1.46	69.0	1.19	45.5	0.36	13.2
Rural and (0,1] miles from UA	4.33	195.	4.07	71.8	5.29	28.0	3.84	102.	3.74	86.0	4.52	71.9
Rural and (1,2] miles from UA	2.77	106.	2.25	29.2	3.39	15.2	2.36	51.4	1.89	31.2	3.16	44.5
Rural and (2,4] miles from UA	1.85	67.2	0.69	6.97	-	-	1.48	30.7	1.27	21.3	2.29	32.3
Log of distance to roads	-0.65	-53.3	-1.07	-22.5	-2.91	-16.7	-1.71	-56.0	-0.96	-33.2	-2.01	-43.0
Log of number of jobs in tract	0.23	49.4	0.11	8.58	0.29	6.79	0.29	32.9	0.34	28.2	0.27	20.8
2010 pop den (0,500] (ref.) PSQM*	-	-	-	-	-	-	-	-	-	-	-	-
2010 pop den (500,1000] PSQM*	1.86	72.8	2.83	35.4	2.08	14.2	1.56	37.4	2.06	42.2	1.48	28.9
2010 pop den (1000,2000] PSQM*	2.22	90.1	3.39	44.5	2.43**	20.3	1.94	44.8	2.27	42.5	1.64	32.1
2010 pop den (2000,4000] PSQM*	2.57	103.	4.18	53.4	2.43**	20.3	2.43	53.0	2.78	52.7	1.72	33.4
2010 pop den of 4000+ PSQM*	3.65	138.	5.11	59.6	2.65	15.4	2.86	64.8	3.71	73.9	2.07	42.9
Constant	-6.92	-179	-5.92	-54.0	-8.58	-24.9	-6.93	-93.5	-7.16	-73.7	-6.92	-64.4
R^2	0.82		0.84		0.81		0.80		0.81		0.75	
Accuracy	0.9512		0.9589		0.9661		0.9493		0.9545		0.9379	
	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes	Pred. No	Pred. Yes
Actual No	414,635	19,729	70,054	2,756	22,722	506	142,203	7,040	76,880	4,878	82,652	4,926
Actual Yes	23,007	419,148	1,931	39,397	456	4,713	6,298	107,621	3,462	98,175	2,890	35,299

*Population density in persons per square mile. **For Vermont, one coefficient was estimated for (1000,4000] PSQM.

TABLE A1
Binary Logit Results (Continued)

	Wisconsin		Wyoming	
	β	t-stat	***β***	t-stat
Urban (UC or UA in 2000)	6.91	175.	9.18	66.1
Closest urban is an urbanized area	1.00	43.7	0.51	8.57
Rural and (0,1] miles from UA	4.05	109.	6.40	46.5
Rural and (1,2] miles from UA	1.49	24.1	3.58	19.3
Rural and (2,4] miles from UA	1.07	19.4	-	-
Log of distance to roads	-1.50	-41.9	-4.50	-19.2
Log of number of jobs in tract	0.26	24.4	0.92	12.6
2010 pop den (0,500] (ref.) PSQM*	-	-	-	-
2010 pop den (500,1000] PSQM*	2.25	47.2	1.95	13.8
2010 pop den (1000,2000] PSQM*	2.44	52.9	2.54**	24.3
2010 pop den (2000,4000] PSQM*	2.88	66.1	2.54**	24.3
2010 pop den of 4000+ PSQM*	3.17	71.4	3.78	27.3
Constant	-6.65	-79.3	-9.79	-36.2
R^2	0.81		0.87	
Accuracy	0.9537		0.9747	
	Pred. No	Pred. Yes	Pred. No	Pred. Yes
Actual No	137,391	6,587	67,169	1,265
Actual Yes	4,169	84,008	866	14,810

*Population density in persons per square mile. **For Wyoming, one coefficient was estimated for (1000,4000] PSQM.

APPENDIX B: RURAL AREAS PREDICTED TO MERGE WITH URBAN CLUSTERS OR URBAN AREAS

Table B1 provides a list of rural (or, more precisely, non-urbanized) areas that are predicted to merge with other urban clusters or urban areas after the 2020 decennial census. Those rural/non-urbanized areas that are absorbed into large urban areas are at risk for losing the ability to use FTA funds for operating expenses for two years and may see significant reductions in the amount of FTA funds that can be used to support operating expenses in years three and beyond.

TABLE B1

List of UCs Predicted to Merge with Other UCs or Urban Areas after 2020 under Different Scenarios

State	2010 Urban Cluster	Name of UC/UA Predicted to Merge Into	UC/ UA	50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi
Alabama	Athens, AL	Huntsville, AL	UA	1*	0	0	0
	Grand Bay, AL	Mobile, AL	UA	1*	1	0	0
	Hazel Green, AL	Huntsville, AL	UA	1*	1	1	0
	Priceville, AL	Decatur, AL	UA	1	1	1	1
	Robertsdale, AL	Daphne–Fairhope, AL	UA	1	1	1	0
Arizona	Buckeye, AZ	Avondale–Goodyear, AZ	UA	1*	1	1	0
	Bullhead City, AZ–NV	Laughlin, NV	UC	1	0	1	0
	Lake of the Woods–Pinetop-Lakeside, AZ	Show Low, AZ	UC	1	0	1	0
	Marana West, AZ	Tucson, AZ	UA	1*	0	0	0
	Nogales, AZ	Rio Rico Northeast, AZ	UC	1	0	1	0
	Rio Rico Northeast, AZ	Nogales, AZ	UC	1	0	1	0
	Show Low, AZ	Lake of the Woods–Pinetop-Lakeside, AZ	UC	1	0	1	0
	Somerton, AZ	Yuma, AZ–CA	UA	1	1	0	0
	Vail, AZ	Tucson, AZ	UA	1*	0	0	0
	Vistancia, AZ	Phoenix–Mesa, AZ	UA	1*	0	0	0
California	Auburn–North Auburn, CA	Sacramento, CA	UA	1*	0	1	0
	Carmel Valley Village, CA	Seaside–Monterey, CA	UA	1	1	1	0
	Cottonwood, CA	Redding, CA	UA	1	0	0	0
	Forestville, CA	Santa Rosa, CA	UA	1*	0	0	0
	Galt, CA	Lodi, CA	UA	1	1	0	0
	Half Moon Bay, CA	San Francisco–Oakland, CA	UA	1*	0	0	0
	Mecca, CA	Indio–Cathedral City, CA	UA	1*	0	0	0
	Nipomo, CA	Arroyo Grande–Grover Beach, CA	UA	1	1	1	0

Note: A * represents a high-risk transition (rural to large urban); a 1 without a * represents a UC growing into a small UA.

TABLE B1

List of UCs Predicted to Merge with Other UCs or Urban Areas after 2020 under Different Scenarios (Continued)

State	2010 Urban Cluster	Name of UC/UA Predicted to Merge Into	UC/ UA	50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi
Colorado	Edwards, CO	Vail, CO	UC	1	0	1	0
	Firestone–Frederick, CO	Longmont, CO	UA	1	1	1	0
	Lochbuie, CO	Denver–Aurora, CO	UA	1*	1	1	0
	Vail, CO	Edwards, CO	UC	1	0	1	0
Connecticut	Jewett City, CT	Worcester, MA–CT	UA	1*	0	1	0
	Willimantic, CT	Hartford, CT	UA	1*	1	1	1*
Delaware	Bridgeville, DE	Salisbury, MD–DE	UA	1	1	1	1
	Georgetown, DE	Millsboro, DE	UC	1	1	0	0
	Middletown, DE	Philadelphia, PA–NJ–DE–MD	UA	1*	1	0	0
	Milford, DE	Dover, DE	UA	1	1	0	0
	Millsboro, DE	Georgetown, DE	UC	1	1	0	0
	Ocean View, DE	Ocean Pines, MD–DE	UC	1	1	0	0
Florida	Crooked Lake Park, FL	Winter Haven, FL	UA	1*	0	0	0
	Crystal River, FL	Homosassa Springs–Beverly Hills–Citrus Springs, FL	UA	1	1	1	1
	Fernandina Beach, FL	Yulee, FL	UC	1	1	1	1
	Four Corners, FL	Orlando, FL	UA	1*	1	1	1*
	Golden Gate Estates, FL	Bonita Springs, FL	UA	1*	0	1	0
	Jupiter Farms, FL	Miami, FL	UA	1*	0	1	0
	Panama City Northeast, FL	Panama City, FL	UA	1	1	1	1
	Poinciana, FL	Kissimmee, FL	UA	1*	1	1	1*
	Rainbow Lakes Estates, FL	Homosassa Springs–Beverly Hills–Citrus Springs, FL	UA	1	0	1	0
	Santa Rosa Beach, FL	Fort Walton Beach–Navarre–Wright, FL	UA	1*	0	1	0
	Sugarmill Woods, FL	Homosassa Springs–Beverly Hills–Citrus Springs, FL	UA	1	1	1	0
	Wedgefield, FL	Orlando, FL	UA	1*	0	0	0
	Yulee, FL	Fernandina Beach, FL	UC	1	1	1	1

Note: A * represents a high-risk transition (rural to large urban); a 1 without a * represents a UC growing into a small UA.

TABLE B1

List of UCs Predicted to Merge with Other UCs or Urban Areas after 2020 under Different Scenarios (Continued)

State	2010 Urban Cluster	Name of UC/UA Predicted to Merge Into	UC/ UA	50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi
Georgia	Buckhead (Bryan County), GA	Savannah, GA	UA	1*	0	0	0
	Lula, GA	Gainesville, GA	UA	1	0	0	0
	Monroe, GA	Atlanta, GA	UA	1*	0	1	0
	Winder, GA	Atlanta, GA	UA	1*	1	1	1*
Hawaii	Haleiwa–Waialua–Pupukea, HI	Urban Honolulu, HI	UA	1*	1	0	0
	Pukalani–Makawao–Haiku–Pauwela, HI	Kahului, HI	UA	1	1	0	0
Idaho	Rathdrum, ID	Coeur d'Alene, ID	UA	1	0	0	0
Illinois	Lake Holiday, IL	Chicago, IL–IN	UA	1*	1	1	0
	Murphysboro, IL	Carbondale, IL	UA	1	1	1	0
	Wonder Lake, IL	Round Lake Beach–McHenry–Grayslake, IL–WI	UA	1*	0	1	0
Indiana	Charlestown, IN	Louisville/Jefferson County, KY–IN	UA	1	1	1	0
	Lowell, IN	Chicago, IL–IN	UA	1*	0	1	0
Kentucky	Nicholasville, KY	Wilmore, KY	UC	1	0	1	0
	Wilmore, KY	Nicholasville, KY	UC	1	0	1	0
Louisiana	Donaldsonville, LA	Baton Rouge, LA	UA	1*	1	1	1
	Galliano–Larose–Cut Off, LA	Houma, LA	UA	1	0	0	0
	Gramercy–Lutcher, LA	New Orleans, LA	UA	1*	1	1	0
	Rayne, LA	Lafayette, LA	UA	1*	0	0	0
Maryland	Glenwood, MD	Baltimore, MD	UA	1*	0	1	0
	Manchester, MD	Baltimore, MD	UA	1*	0	0	0
	Romancoke, MD	Baltimore, MD	UA	1*	0	0	0
	Ocean Pines, MD–DE	Ocean View, DE	UC	1	1	0	0
Massachusetts	North Brookfield, MA	Worcester, MA–CT	UA	1*	0	1	0
	North Adams, MA–VT	Pittsfield, MA	UA	1	0	1	0

Note: A * represents a high-risk transition (rural to large urban); a 1 without a * represents a UC growing into a small UA.

TABLE B1

List of UCs Predicted to Merge with Other UCs or Urban Areas after 2020 under Different Scenarios (Continued)

State	2010 Urban Cluster	Name of UC/UA Predicted to Merge Into	UC/ UA	50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi
Michigan	Cedar Springs, MI	Grand Rapids, MI	UA	1*	1	1	0
	Fowlerville, MI	South Lyon–Howell, MI	UA	1	0	0	0
	Goodrich, MI	Detroit, MI	UA	1*	0	0	0
	Paw, MI	Kalamazoo, MI	UA	1*	1	0	0
	Sparta, MI	Grand Rapids, MI	UA	1*	0	1	0
Minnesota	Monticello–Big Lake, MN	Minneapolis–St. Paul, MN–WI	UA	1*	1	1	0
	Stewartville, MN	Rochester, MN	UA	1	0	0	0
Mississippi	Canton, MS	Jackson, MS	UA	1*	1	0	0
	Gautier, MS	Pascagoula, MS	UA	1	1	0	0
Missouri	Branson, MO	Forsyth, MO	UC	1	0	0	0
	Eureka, MO	St. Louis, MO–IL	UA	1*	0	0	0
	Forsyth, MO	Branson, MO	UC	1	0	0	0
	Platte City, MO	Kansas City, MO–KS	UA	1*	1	1	0
	Smithville North, MO	Kansas City, MO–KS	UA	1*	1	1	0
	Willard, MO	Springfield, MO	UA	1*	0	1	0
Montana	Belgrade, MT	Bozeman, MT	UC	1	0	1	0
	Bozeman, MT	Belgrade, MT	UC	1	0	1	0
	Laurel, MT	Billings, MT	UA	1	1	0	0

Note: A * represents a high-risk transition (rural to large urban); a 1 without a * represents a UC growing into a small UA.

TABLE B1

List of UCs Predicted to Merge with Other UCs or Urban Areas after 2020 under Different Scenarios (Continued)

State	2010 Urban Cluster	Name of UC/UA Predicted to Merge Into	UC/ UA	50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi
Nebraska	Plattsmouth, NE	Omaha, NE–IA	UA	1*	0	1	0
Nevada	Laughlin, NV	Bullhead City, AZ–NV	UC	1	0	1	0
New Hampshire	Concord, NH	Manchester, NH	UA	1	1	0	0
	Epping, NH	Boston, MA–NH–RI	UA	1*	1	1	0
New Jersey	Newton, NJ	New York–Newark, NY–NJ–CT	UA	1*	1	1	1*
New Mexico	Aztec, NM	Farmington, NM	UA	1	0	1	0
	Kirtland, NM	Farmington, NM	UA	1	0	1	0
New York	Bedford, NY	New York–Newark, NY–NJ–CT	UA	1*	0	1	0
	Chester, NY	Poughkeepsie–Newburgh, NY–NJ	UA	1*	0	1	0
	Lockport, NY	Buffalo, NY	UA	1*	0	1	0
	Maybrook, NY	Walden, NY	UC	1	0	1	0
	Ravena, NY	Albany–Schenectady, NY	UA	1*	0	0	0
	Walden, NY	Poughkeepsie–Newburgh, NY–NJ	UA	1*	0	1	0
North Carolina	Archer Lodge–Clayton, NC	Raleigh, NC	UA	1*	1	0	0
	Fearrington Village, NC	Durham, NC	UA	1*	1	0	0
	Grifton, NC	Greenville, NC	UA	1	1	0	0
	Havelock, NC	New Bern, NC	UA	1	1	0	0
	Lake Norman of Catawba, NC	Charlotte, NC–SC	UA	1*	1	1	0
	Maiden, NC	Hickory, NC	UA	1*	0	0	0
	Oak Island, NC	St. James, NC	UC	1	0	1	0
	Pinehurst–Southern Pines, NC	Whispering Pines, NC	UC	1	0	1	0
	Smithfield, NC	Raleigh, NC	UA	1*	1	0	0
	St. James, NC	Oak Island, NC	UC	1	0	1	0
	Wendell–Zebulon, NC	Raleigh, NC	UA	1*	0	1	0
	Whispering Pines, NC	Pinehurst–Southern Pines, NC	UC	1	0	1	0
North Dakota	Lincoln, ND	Bismarck, ND	UA	1	1	0	0

Note: A * represents a high-risk transition (rural to large urban); a 1 without a * represents a UC growing into a small UA.

TABLE B1

List of UCs Predicted to Merge with Other UCs or Urban Areas After 2020 Under Different Scenarios (Continued)

State	2010 Urban Cluster	Name of UC/UA Predicted to Merge Into	UC/ UA	50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi
Ohio	Ashtabula, OH	Conneaut, OH	UC	1	1	1	1
	Conneaut, OH	Ashtabula, OH	UC	1	1	1	1
	Genoa, OH	Toledo, OH–MI	UA	1*	0	1	0
	Sandusky, OH	Lorain–Elyria, OH	UA	1	0	1	0
Oklahoma	Claremore, OK	Tulsa, OK	UA	1*	0	0	0
	Collinsville, OK	Tulsa, OK	UA	1*	1	1	0
	Harrah, OK	Oklahoma City, OK	UA	1*	0	0	0
Oregon	Aumsville, OR	Salem, OR	UA	1*	0	0	0
Pennsylvania	Burgettstown, PA	Pittsburgh, PA	UA	1*	0	1	0
	Fairdale, PA	Masontown, PA	UC	1	0	1	0
	Jersey Shore, PA	Lock Haven, PA	UC	1	1	1	1
	Lock Haven, PA	Jersey Shore, PA	UC	1	1	1	1
	Lykens, PA	Williamstown, PA	UC	1	1	1	1
	Masontown, PA	Fairdale, PA	UC	1	0	1	0
	Quarryville, PA	Lancaster, PA	UA	1*	0	1	0
	Roaring Spring, PA	Altoona, PA	UA	1	1	1	1
	Saw Creek, PA	East Stroudsburg, PA–NJ	UA	1	1	0	0
	Williamstown, PA	Lykens, PA	UC	1	1	1	1
South Carolina	Camden, SC	Columbia, SC	UA	1*	0	1	0
	Chesnee, SC	Spartanburg, SC	UA	1*	1	0	0
	Clover, SC	Rock Hill, SC	UA	1	0	0	0
	Lake Murray North Shore, SC	Columbia, SC	UA	1*	0	1	0
	Seneca, SC	Greenville, SC	UA	1*	0	1	0
	Sun City Hilton Head, SC	Hilton Head Island, SC	UA	1	0	1	0
	York, SC	Rock Hill, SC	UA	1	1	0	0

Note: A * represents a high-risk transition (rural to large urban); a 1 without a * represents a UC growing into a small UA.

TABLE B1

List of UCs Predicted to Merge with Other UCs or Urban Areas After 2020 Under Different Scenarios (Continued)

State	2010 Urban Cluster	Name of UC/UA Predicted to Merge Into	UC/ UA	50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi
South Dakota	Brandon, SD	Sioux Falls, SD	UA	1	1	0	0
	Harrisburg, SD	Sioux Falls, SD	UA	1	1	0	0
Tennessee	Arlington, TN	Memphis, TN–MS–AR	UA	1*	1	1	0
	Atoka, TN	Memphis, TN–MS–AR	UA	1*	0	0	0
	Jasper, TN	South Pittsburg, TN–AL	UC	1	0	1	0
	Norris, TN	Knoxville, TN	UA	1*	0	0	0
	White Pine, TN	Morristown, TN	UA	1	0	0	0
	South Pittsburg, TN–AL	Jasper, TN	UC	1	0	1	0
Texas	Aledo, TX	Weatherford, TX	UC	1	0	0	0
	Alvarado, TX	Dallas–Fort Worth–Arlington, TX	UA	1*	0	0	0
	Anna, TX	McKinney, TX	UA	1*	0	0	0
	Boerne, TX	San Antonio, TX	UA	1*	1	1	0
	Canyon, TX	Mescalero Park, TX	UC	1	0	0	0
	Cleburne, TX	Dallas–Fort Worth–Arlington, TX	UA	1*	1	1	0
	Cleveland, TX	Houston, TX	UA	1*	1	1	0
	Deerwood, TX	Conroe–The Woodlands, TX	UA	1*	0	0	0
	Denton Southwest, TX	Denton–Lewisville, TX	UA	1*	1	1	0
	Devine, TX	Lytle, TX	UC	1	1	1	0
	Forney, TX	Dallas–Fort Worth–Arlington, TX	UA	1*	1	0	0
	Granbury, TX	Pecan Plantation, TX	UC	1	0	1	0
	Grangerland, TX	Houston, TX	UA	1*	1	0	0
	Hempstead, TX	Prairie View, TX	UC	1	0	1	0
	Homesteads Addition, TX	Dallas–Fort Worth–Arlington, TX	UA	1*	1	0	0
	Justin, TX	Dallas–Fort Worth–Arlington, TX	UA	1*	0	0	0
	Lake Conroe Eastshore, TX	Conroe–The Woodlands, TX	UA	1*	1	1	0

Note: A * represents a high-risk transition (rural to large urban); a 1 without a * represents a UC growing into a small UA.

TABLE B1

List of UCs Predicted to Merge with Other UCs or Urban Areas After 2020 Under Different Scenarios (Continued)

State	2010 Urban Cluster	Name of UC/UA Predicted to Merge Into	UC/ UA	50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi
Texas (Continued)	Lake Conroe Northshore, TX	Conroe–The Woodlands, TX	UA	1*	1	0	0
	Lake Conroe Westshore, TX	Conroe–The Woodlands, TX	UA	1*	1	1	0
	Lytle, TX	Devine, TX	UC	1	1	1	0
	Magnolia, TX	Houston, TX	UA	1*	1	0	0
	Manor, TX	Austin, TX	UA	1*	1	1	0
	Mescalero Park, TX	Canyon, TX	UC	1	0	0	0
	Odem, TX	Corpus Christi, TX	UA	1*	1	0	0
	Paloma Creek South–Paloma Creek, TX	Dallas–Fort Worth–Arlington, TX	UA	1*	0	1	0
	Pecan Acres, TX	Dallas–Fort Worth–Arlington, TX	UA	1*	1	0	0
	Pecan Plantation, TX	Granbury, TX	UC	1	0	1	0
	Prairie View, TX	Hempstead, TX	UC	1	0	1	0
	Rio Hondo, TX	Harlingen, TX	UA	1	1	1	0
	Seguin, TX	San Antonio, TX	UA	1*	0	0	0
	Springtown, TX	Dallas–Fort Worth–Arlington, TX	UA	1*	0	0	0
	Weatherford, TX	Aledo, TX	UC	1	0	0	0
Utah	Park City, UT	Summit Park, UT	UC	1	0	1	0
	Santaquin, UT	Provo–Orem, UT	UA	1*	0	0	0
	Summit Park, UT	Park City, UT	UC	1	0	1	0
Vermont	Milton, VT	Burlington, VT	UA	1	1	0	0
Virginia	Purcellville, VA	Washington, DC–VA–MD	UA	1*	1	1	1*
Washington	Granite Falls, WA	Marysville, WA	UA	1	1	0	0
	Indianola, WA	Bremerton, WA	UA	1*	0	1	0
	Snoqualmie, WA	Seattle, WA	UA	1*	0	1	0

Note: A * represents a high-risk transition (rural to large urban); a 1 without a * represents a UC growing into a small UA.

TABLE B1

List of UCs Predicted to Merge with Other UCs or Urban Areas After 2020 Under Different Scenarios (Continued)

State	2010 Urban Cluster	Name of UC/UA Predicted to Merge Into	UC/ UA	50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi
Wisconsin	Burlington, WI	Milwaukee, WI	UA	1*	0	1	0
	Lake Geneva, WI	Walworth, WI	UC	1	0	0	0
	Mukwonago, WI	Milwaukee, WI	UA	1*	0	0	0
	Union Grove, WI	Racine, WI	UA	1	0	0	0
	Walworth, WI	Lake Geneva, WI	UC	1	0	0	0
	Hudson, WI–MN	Minneapolis–St. Paul, MN–WI	UA	1*	0	1	0

Note: A * represents a high-risk transition (rural to large urban); a 1 without a * represents a UC growing into a small UA.

APPENDIX C: SUPPORTING TABLES FOR PREDICTED CHANGES IN § 5311 AND § 5307 FUNDING ALLOCATIONS

This appendix contains supporting tables for the following future scenarios:

- Scenario 1A corresponds to the 50% probability model using a ½ mile distance threshold
- Scenario 1B corresponds to the 50% probability model using a 0 mile distance threshold
- Scenario 2A corresponds to the 75% probability model using a ½ mile distance threshold
- Scenario 2B corresponds to the 75% probability model using a 0 mile distance threshold

Table C1 summarizes the predicted changes in urbanized populations and land area that are the key inputs to determining the § 5311 funding apportionments. Table C1 also shows the *percentage* of the total § 5311 funding each state currently receives and compares this to the percentage each state is forecasted to receive after the 2020 decennial census. Note that the percentages shown in Table C1 do not take into account any overall change in the total § 5311 apportionment, but instead represent an "apportionment quotient." The apportionment quotient allows for a comparison of relative changes in funding categories without relying on funding data. The quotient represents each state's unconstrained share of the appropriated funds through the § 5311 formula. This quotient was calculated by dividing each state's national share of non-urbanized land area and population over the total non-urbanized land area and population for the U.S. in 2010. Each state's land area portion was multiplied by 20% and its population portion was multiplied by 80%. These two percentages were used to determine the state's total apportionment. No state was eligible to receive more than a 5% share of its portion of non-urbanized land area (i.e., Alaska and Texas). This was not corrected for, but this only affects 1.98% of funding nationally, from one state (i.e., Texas).

Tables C2 to C5 show the changes in § 5311 and § 5307 funding each state would experience if the FTA data values from FY19 were applied to the new population, population density, and other inputs used in the allocation formula after the 2020 census. Table C2 reports the forecasts for the § 5311 program. Note that this includes only the § 5311 portion and not the § 5340 growing states portion. FTA typically publishes the combined total of the § 5311 and § 5340 programs, e.g., in FY2019 this combined appropriation was $24.5M for Georgia and $716.4M nationally for the 50 states. The last two columns on Table C2 show the combined total of the § 5311 and § 5340 programs by state[5] and the percent of the total funding that is associated with the § 5340 program. In a separate calculation, we determined that of the $24.5M for Georgia, approximately 13% corresponds to the growing states program and 87% to the § 5311 program. Thus, our overall number for the § 5311 program of $629M would be approximately equivalent to $723M at the national level for the combined § 5311 and § 5340 program, which is

[5] Data for American Samoa, Guam, N. Marina Islands, Puerto Rico is not included in our analysis. In FY19, they received $3,856,817 in combined § 5311 and § 5340 funding.

consistent with the number published by the Federal Register (Federal Register 2019). That is, we estimate that our methodology to replicate the federal funding formulas are within 1 to 2 percent of the actual appropriation.

Tables C3 to C5 report the forecasts for the § 5307 program, which are categorized for large urban areas with populations of 1M or more, large urban areas with populations of 200K–1M, and small urban areas with populations of 50K–200K, respectively. Note that the total amount of § 5311 and § 5307 fund appropriated after the 2020 decennial census as of the time of this writing is unknown; as such, these results reflect the shift in funding needs from rural and large urban areas to smaller urban areas that would be needed after the 2020 decennial census to effectively "maintain" current levels of FTA funding that transit systems in each category currently receive. Similar to before, our § 5307 calculations do not include the growing states portion. FTA typically publishes the combined total of the § 5307 and § 5340 programs, e.g., in FY2019 this combined appropriation was $101M for Georgia and $5.33B nationally. In our separate calculations, we determined that of this $101M, approximately 4% corresponds to the growing states program and 96% to the § 5311 program. Thus, our overall number for the § 5307 program of $4.62B would be approximately equivalent to $4.80B at the national level, which is consistent with the number published in the Federal Register of $4.83B (Federal Register 2019). That is, we estimate that our methodology to replicate the federal funding formulas are within 3 to 4 percent of the actual appropriation.

TABLE C1 Percent Change in § 5311 Apportionment (2010–2020)

	National Population Share (%)					National Land Area Share (%)					Total § 5311 Apportionment (%)					% Change in Apportionment			
Year	**2010**	**2020**				**2010**	**2020**				**2010**	**2020**							
Scen-ario		**50% ½ mi**	**50% 0 mi**	**75% ½ mi**	**75% 0 mi**		**50% ½ mi**	**50% 0 mi**	**75% ½ mi**	**75% 0 mi**		**50% ½ mi**	**50% 0 mi**	**75% ½ mi**	**75% 0 mi**	**50% ½ mi**	**50% 0 mi**	**75% ½ mi**	**75% 0 mi**
AK	0.44	0.43	0.42	0.42	0.41	16.56	7.42	7.41	7.37	7.37	3.67	1.83	1.82	1.81	1.80	-1.84	-1.85	-1.86	-1.86
AL	2.76	2.74	2.70	2.75	2.74	1.42	1.51	1.51	1.52	1.52	2.49	2.49	2.47	2.50	2.49	0.00	-0.03	0.01	0.01
AR	1.98	2.10	2.04	2.02	2.00	1.49	1.60	1.60	1.59	1.59	1.89	2.00	1.96	1.93	1.92	0.11	0.07	0.05	0.04
AS*	1.43	1.46	1.43	1.40	1.43	3.24	3.49	3.49	3.47	3.24	1.80	1.87	1.84	1.81	1.79	0.07	0.04	0.01	0.00
AZ	0.06	1.19	1.20	1.34	1.35	0.00	3.46	3.46	3.47	3.47	0.05	1.64	1.65	1.76	1.78	1.59	1.60	1.71	1.73
CA	4.14	4.17	4.16	4.16	4.19	4.31	4.60	4.60	4.61	4.61	4.18	4.25	4.25	4.25	4.27	0.08	0.07	0.07	0.11
CO	1.31	1.31	1.28	1.28	1.31	2.97	3.19	3.18	3.18	3.18	1.64	1.68	1.66	1.66	1.69	0.04	0.02	0.02	0.05
CT	0.61	0.55	1.59	0.55	0.55	0.09	0.09	0.11	0.10	0.10	0.51	0.46	1.29	0.46	0.46	-0.05	0.79	-0.05	-0.04
DC*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DE	0.32	0.27	0.26	0.34	0.34	0.05	0.05	0.05	0.05	0.05	0.26	0.23	0.22	0.28	0.28	-0.04	-0.04	0.02	0.02
FL	2.66	2.26	2.24	2.43	2.45	1.36	1.39	1.39	1.44	1.45	2.40	2.08	2.07	2.23	2.25	-0.32	-0.33	-0.16	-0.14
GA	3.78	3.62	3.56	3.62	3.61	1.55	1.64	1.64	1.66	1.66	3.33	3.23	3.18	3.23	3.22	-0.10	-0.15	-0.10	-0.10
GU*	0.18	0.18	0.18	0.17	0.18	0.01	0.01	0.01	0.01	0.01	0.14	0.15	0.14	0.14	0.14	0.00	0.00	0.00	0.00
HI	0.44	0.43	0.42	0.46	0.46	0.18	0.19	0.19	0.19	0.19	0.39	0.38	0.37	0.41	0.40	0.00	-0.01	0.02	0.02
IA	2.00	2.04	1.98	1.97	1.95	1.60	1.72	1.72	1.71	1.71	1.92	1.97	1.93	1.92	1.91	0.05	0.01	0.00	-0.01
ID	0.87	0.86	0.85	0.84	0.83	2.39	2.53	2.52	2.51	2.51	1.18	1.19	1.18	1.17	1.17	0.02	0.01	0.00	0.00
IL	2.89	2.81	2.75	2.80	2.80	1.51	1.60	1.60	1.62	1.62	2.62	2.57	2.52	2.56	2.56	-0.05	-0.10	-0.06	-0.05
IN	2.98	2.95	2.89	2.87	2.86	0.98	1.04	1.04	1.05	1.05	2.58	2.57	2.52	2.50	2.50	-0.01	-0.06	-0.08	-0.07
KS	1.60	1.64	1.60	1.59	1.57	2.35	2.53	2.53	2.52	2.52	1.75	1.82	1.79	1.77	1.76	0.07	0.04	0.02	0.02
KY	2.88	2.95	2.87	2.85	2.82	1.12	1.20	1.20	1.20	1.20	2.53	2.60	2.54	2.52	2.50	0.07	0.01	-0.01	-0.02
LA	1.97	1.93	1.92	1.96	1.96	1.21	1.29	1.28	1.29	1.29	1.82	1.80	1.79	1.83	1.83	-0.02	-0.03	0.00	0.01
MA	0.71	0.66	0.67	0.66	0.68	0.14	0.15	0.15	0.15	0.15	0.60	0.56	0.57	0.56	0.58	-0.04	-0.03	-0.04	-0.02
MD	1.07	1.06	1.05	1.07	1.06	0.23	0.24	0.24	0.24	0.24	0.90	0.89	0.88	0.90	0.90	-0.01	-0.02	0.00	0.00
ME	1.10	1.16	1.13	1.12	1.11	0.89	0.95	0.95	0.95	0.95	1.06	1.12	1.09	1.09	1.08	0.06	0.03	0.03	0.02
MI	3.74	3.62	3.55	3.55	3.53	1.55	1.66	1.66	1.66	1.66	3.30	3.23	3.17	3.17	3.15	-0.08	-0.14	-0.13	-0.14
MN	2.51	2.52	2.47	2.45	2.47	2.28	2.44	2.44	2.43	2.43	2.46	2.51	2.46	2.45	2.46	0.04	0.00	-0.01	0.01
MO	2.93	2.97	2.91	2.89	2.89	1.95	2.08	2.08	2.09	2.09	2.73	2.79	2.75	2.73	2.73	0.06	0.02	0.00	0.01

*AS=American Samoa, DC=Washington DC, GU=Guam, MP=Northern Marina Islands, PR= Puerto Rico, VI=Virgin Islands. Other initials represent states.

TABLE C1 Percent Change in § 5311 Apportionment (2010–2020) (Continued)

	National Population Share					National Land Area Share					Total § 5311 Apportionment					% Change in Apportionment			
Year	**2010**	**2020**				**2010**	**2020**				**2010**	**2020**							
Scen-ario		**50% ½ mi**	**50% 0 mi**	**75% ½ mi**	**75% 0 mi**		**50% ½ mi**	**50% 0 mi**	**75% ½ mi**	**75% 0 mi**		**50% ½ mi**	**50% 0 mi**	**75% ½ mi**	**75% 0 mi**	**50% ½ mi**	**50% 0 mi**	**75% ½ mi**	**75% 0 mi**
MP*	0.06	0.06	2.37	2.38	2.36	0.01	0.01	1.43	1.44	1.44	0.05	0.05	0.05	0.05	0.05	0.00	0.00	0.00	-0.00
MS	2.42	2.43	0.75	0.81	0.80	1.34	1.44	4.54	4.51	4.51	2.20	2.23	2.18	2.19	2.17	0.03	-0.02	-0.01	-0.03
MT	0.82	0.77	4.61	4.77	4.75	4.22	4.54	1.37	1.39	1.39	1.50	1.52	1.51	1.55	1.54	0.02	0.01	0.05	0.04
NC	4.84	4.64	0.49	0.49	0.49	1.31	1.37	2.15	2.14	2.14	4.14	3.99	3.96	4.09	4.08	-0.15	-0.18	-0.05	-0.06
ND	0.45	0.50	0.95	0.93	0.93	2.00	2.15	2.38	2.37	2.37	0.76	0.83	0.82	0.82	0.82	0.07	0.06	0.06	0.06
NE	0.95	0.96	0.72	0.78	0.78	2.22	2.38	0.26	0.26	0.26	1.20	1.25	1.23	1.22	1.22	0.05	0.03	0.02	0.02
NH	0.78	0.74	0.70	0.70	0.70	0.24	0.26	0.14	0.14	0.14	0.67	0.64	0.63	0.68	0.68	-0.03	-0.04	0.01	0.01
NJ	0.77	0.72	0.98	1.06	1.07	0.13	0.14	3.77	3.75	3.75	0.64	0.60	0.59	0.59	0.58	-0.04	-0.05	-0.05	-0.06
NM	1.07	0.99	0.06	0.06	0.06	3.51	3.77	0.01	0.01	0.01	1.56	1.54	1.54	1.60	1.60	-0.02	0.00	0.00	0.00
NV	0.34	0.44	0.43	0.44	0.43	3.17	3.40	3.40	3.39	3.39	0.90	1.04	1.03	1.03	1.02	0.13	0.12	0.12	0.12
NY	3.78	3.73	3.76	3.63	3.65	1.27	1.36	1.36	1.35	1.35	3.28	3.26	3.28	3.17	3.19	-0.02	0.00	-0.10	-0.08
OH	4.51	4.43	4.37	4.30	4.32	1.08	1.15	1.15	1.15	1.16	3.82	3.77	3.73	3.67	3.69	-0.05	-0.09	-0.15	-0.12
OK	2.29	2.27	2.26	2.35	2.34	1.97	2.11	2.11	2.10	2.10	2.22	2.24	2.23	2.30	2.29	0.01	0.00	0.08	0.07
OR	1.62	1.68	1.64	1.64	1.62	2.76	2.97	2.97	2.96	2.96	1.85	1.94	1.91	1.90	1.89	0.09	0.06	0.05	0.05
PA	4.19	4.14	4.05	4.02	4.00	1.18	1.27	1.27	1.26	1.26	3.59	3.57	3.49	3.47	3.45	-0.02	-0.10	-0.12	-0.12
PR*	0.39	0.40	0.39	0.38	0.39	0.05	0.06	0.06	0.06	0.05	0.32	0.33	0.32	0.31	0.32	0.01	0.00	-0.01	0.00
RI	0.11	0.11	0.11	0.11	0.11	0.02	0.02	0.02	0.02	0.02	0.09	0.09	0.09	0.09	0.09	0.00	0.00	0.00	0.00
SC	2.30	2.08	2.10	2.12	2.17	0.82	0.85	0.85	0.87	0.87	2.01	1.83	1.85	1.87	1.91	-0.17	-0.15	-0.13	-0.09
SD	0.64	0.68	0.66	0.67	0.67	2.20	2.36	2.36	2.35	2.35	0.95	1.02	1.00	1.01	1.00	0.06	0.05	0.05	0.05
TN	3.26	3.26	3.21	3.28	3.27	1.13	1.20	1.20	1.21	1.21	2.83	2.85	2.81	2.87	2.86	0.01	-0.03	0.03	0.04
TX	6.92	6.76	6.68	7.04	7.09	7.37	7.82	7.82	7.87	7.87	7.01	6.98	6.91	7.20	7.24	-0.03	-0.10	0.20	0.26
UT	0.59	0.64	0.64	0.64	0.63	2.36	2.51	2.51	2.50	2.50	0.94	1.01	1.01	1.01	1.00	0.07	0.07	0.07	0.06
VA	2.72	2.82	2.75	2.77	2.74	1.08	1.15	1.15	1.15	1.15	2.39	2.49	2.43	2.44	2.42	0.09	0.04	0.05	0.04
VI*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VT	0.58	0.60	0.58	0.58	0.58	0.27	0.29	0.29	0.28	0.28	0.52	0.54	0.52	0.52	0.52	0.02	0.01	0.00	0.00
WA	1.89	1.92	1.91	1.88	1.91	1.87	2.01	2.01	2.00	2.00	1.89	1.94	1.93	1.91	1.92	0.05	0.04	0.02	0.04

*AS=American Samoa, DC=Washington DC, GU=Guam, MP=Northern Marina Islands, PR= Puerto Rico, VI=Virgin Islands. Other initials represent states.

TABLE C1 Percent Change in § 5311 Apportionment (2010–2020) (Continued)

Scen-ario		50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi		50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi		50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi	50% ½ mi	50% 0 mi	75% ½ mi	75% 0 mi
WI	2.83	2.77	2.79	2.72	2.75	1.53	1.64	1.64	1.64	1.64	2.57	2.55	2.56	2.50	2.52	-0.02	-0.01	-0.07	-0.04
WV	1.39	1.46	1.42	1.41	1.40	0.69	0.74	0.74	0.73	0.73	1.25	1.31	1.28	1.27	1.27	0.06	0.03	0.02	0.02
WY	0.48	0.53	0.52	0.51	0.50	2.82	3.03	3.03	3.01	3.01	0.95	1.03	1.02	1.01	1.00	0.08	0.07	0.06	0.06

*AS=American Samoa, DC=Washington DC, GU=Guam, MP=Northern Marina Islands, PR= Puerto Rico, VI=Virgin Islands. Other initials represent states.

TABLE C2

Comparison of Current (FY19) and Future § 5311 Funding by State (Assumes Same FTA Data Values)

	§ 5311 Appropriation	§ 5311 Forecast		Forecast – FY19 Appropriation		% Diff (Forecast – FY19)		Actual § 5311 and § 5340 Appropriation	% § 5340 in Appr.
State	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**FY19**	**FY19**
AK	9,065,348	8,350,472	8,349,117	-714,876	-716,231	-8%	-8%	9,427,438	4%
AL	15,608,151	11,693,306	11,022,482	-3,914,845	-4,585,669	-25%	-29%	17,799,272	12%
AR	12,395,276	10,311,876	10,303,497	-2,083,400	-2,091,779	-17%	-17%	14,000,223	11%
AZ	12,337,581	9,455,187	8,379,374	-2,882,394	-3,958,207	-23%	-32%	13,678,385	10%
CA	27,739,204	22,313,491	21,189,201	-5,425,713	-6,550,003	-20%	-24%	31,257,249	11%
CO	11,798,741	9,565,234	9,252,016	-2,233,507	-2,546,725	-19%	-22%	13,042,941	10%
CT	2,908,207	1,107,710	958,179	-1,800,497	-1,950,028	-62%	-67%	3,372,123	14%
DE	1,666,013	1,435,343	1,013,291	-230,670	-652,722	-14%	-39%	1,941,404	14%
FL	15,731,428	10,225,239	9,606,752	-5,506,189	-6,124,676	-35%	-39%	18,257,477	14%
GA	21,190,416	16,275,942	15,914,485	-4,914,474	-5,275,931	-23%	-25%	24,524,576	14%
HI	2,612,904	2,673,114	2,370,647	60,210	-242,257	2%	-9%	2,972,961	12%
IA	12,472,602	10,941,200	10,921,068	-1,531,402	-1,551,534	-12%	-12%	14,097,605	12%
ID	8,154,661	6,403,948	6,305,164	-1,750,713	-1,849,497	-21%	-23%	8,967,295	9%
IL	16,691,323	14,394,258	13,753,930	-2,297,065	-2,937,393	-14%	-18%	18,863,416	12%
IN	15,921,007	12,624,186	12,417,564	-3,296,821	-3,503,443	-21%	-22%	18,324,478	13%
KS	11,501,401	10,230,491	10,223,947	-1,270,910	-1,277,454	-11%	-11%	12,765,647	10%
KY	17,031,406	15,006,099	14,996,023	-2,025,307	-2,035,383	-12%	-12%	19,346,765	12%
LA	11,578,172	8,397,272	7,996,376	-3,180,900	-3,581,796	-27%	-31%	13,158,010	12%
MA	3,586,270	1,481,279	1,259,885	-2,104,991	-2,326,385	-59%	-65%	4,185,221	14%
MD	5,432,142	3,238,043	3,030,024	-2,194,099	-2,402,118	-40%	-44%	6,317,468	14%
ME	7,211,895	5,621,543	5,615,730	-1,590,352	-1,596,165	-22%	-22%	8,063,252	11%
MI	21,177,294	15,994,943	15,432,304	-5,182,351	-5,744,990	-24%	-27%	24,084,118	12%
MN	15,803,225	14,095,286	13,765,361	-1,707,939	-2,037,864	-11%	-13%	17,918,414	12%
MO	17,964,320	15,855,404	15,546,133	-2,108,916	-2,418,187	-12%	-13%	20,285,797	11%
MS	14,353,859	12,605,859	12,363,723	-1,748,000	-1,990,136	-12%	-14%	16,215,551	11%

TABLE C2

Comparison of Current (FY19) and Future § 5311 Funding by State (Assumes Same FTA Data Values) (Continued)

	§ 5311 Appropriation	§ 5311 Forecast		Forecast – FY19 Appropriation		% Diff (Forecast – FY19)		Actual § 5311 and § 5340 Appropriation	% § 5340 in Appr.
State	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**FY19**	**FY19**	**50% ½ mi**	**FY19**	**FY19**
MT	10,909,730	8,661,335	7,783,432	-2,248,395	-3,126,298	-21%	-29%	11,618,598	6%
NC	26,494,927	19,894,692	18,209,622	-6,600,235	-8,285,305	-25%	-31%	30,794,235	14%
ND	5,478,259	4,270,209	4,094,386	-1,208,050	-1,383,873	-22%	-25%	5,908,127	7%
NE	8,080,019	6,996,160	6,923,017	-1,083,859	-1,157,002	-13%	-14%	8,879,328	9%
NH	3,924,278	3,087,179	2,579,186	-837,099	-1,345,092	-21%	-34%	4,551,832	14%
NJ	3,785,847	1,903,974	1,899,890	-1,881,873	-1,885,957	-50%	-50%	4,384,421	14%
NM	11,102,161	9,320,795	8,201,067	-1,781,366	-2,901,094	-16%	-26%	11,944,762	7%
NV	6,801,059	5,898,607	5,893,845	-902,452	-907,214	-13%	-13%	7,116,819	4%
NY	20,580,008	15,273,515	14,754,511	-5,306,493	-5,825,497	-26%	-28%	23,503,142	12%
OH	23,156,208	18,681,172	18,274,971	-4,475,036	-4,881,237	-19%	-21%	26,668,523	13%
OK	14,989,643	13,591,762	12,189,552	-1,397,881	-2,800,091	-9%	-19%	16,898,264	11%
OR	12,577,795	10,503,786	10,463,056	-2,074,009	-2,114,739	-16%	-17%	14,025,727	10%
PA	21,705,974	14,650,572	14,350,343	-7,055,402	-7,355,631	-33%	-34%	24,945,192	13%
RI	545,665	97,744	90,953	-447,921	-454,712	-82%	-83%	632,431	14%
SC	12,662,470	8,179,026	7,150,048	-4,483,444	-5,512,422	-35%	-44%	14,739,811	14%
SD	6,808,536	6,008,575	5,882,646	-799,961	-925,890	-12%	-14%	7,373,772	8%
TN	18,451,526	15,223,310	14,248,797	-3,228,216	-4,202,729	-17%	-23%	21,241,675	13%
TX	40,448,609	37,862,478	34,983,058	-2,586,131	-5,465,551	-6%	-14%	47,163,642	14%
UT	6,681,416	5,710,939	5,595,263	-970,477	-1,086,153	-15%	-16%	7,247,225	8%
VA	14,615,402	10,515,405	10,497,043	-4,099,997	-4,118,359	-28%	-28%	16,935,907	14%
VT	3,960,275	3,724,090	3,585,952	-236,185	-374,323	-6%	-9%	4,403,771	10%
WA	12,743,571	9,903,178	9,484,247	-2,840,393	-3,259,324	-22%	-26%	14,510,893	12%
WI	15,825,451	12,966,172	12,387,348	-2,859,279	-3,438,103	-18%	-22%	18,067,921	12%
WV	7,863,875	5,922,254	5,914,288	-1,941,621	-1,949,587	-25%	-25%	8,873,281	11%
WY	6,881,466	5,771,587	5,771,338	-1,109,879	-1,110,128	-16%	-16%	7,262,958	5%
TOTAL	629,007,016	504,915,243	483,194,130	-124,091,773	-145,812,886	-20%	-23%	712,559,343	12%

TABLE C3

Comparison of Current (FY19) and Future § 5307 Funding for Large Urban Areas with Population of 1M or More (Assumes Same FTA Data Values)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Atlanta, GA	69,110,223	74,241,598	74,656,878	5,131,375	5,546,655	7.4%	8.0%
Austin, TX	30,638,400	30,063,025	30,206,868	-575,375	-431,532	-1.9%	-1.4%
Baltimore, MD	52,915,892	50,356,876	50,485,494	-2,559,016	-2,430,398	-4.8%	-4.6%
Boston, MA–NH–RI	123,060,958	94,020,265	94,108,958	-29,040,693	-28,952,000	-23.6%	-23.5%
Bridgeport–Stamford, CT–NY*	19,460,666		27,592,493		8,131,827	0.0%	41.8%
Charlotte, NC–SC	18,036,007	27,345,556	27,483,922	9,309,549	9,447,915	51.6%	52.4%
Chicago, IL–IN	253,006,909	194,318,318	194,495,177	-58,688,591	-58,511,732	-23.2%	-23.1%
Cincinnati, OH–KY–IN	18,306,261	27,162,793	27,229,400	8,856,532	8,923,139	48.4%	48.7%
Cleveland, OH	26,801,584	32,039,594	32,087,579	5,238,010	5,285,995	19.5%	19.7%
Columbus, OH	16,872,226	15,360,528	15,391,986	-1,511,698	-1,480,240	-9.0%	-8.8%
Dallas–Fort Worth–Arlington, TX	74,345,825	67,579,177	68,353,428	-6,766,648	-5,992,397	-9.1%	-8.1%
Denver–Aurora, CO	55,762,916	54,788,647	54,842,789	-974,269	-920,127	-1.7%	-1.7%
Detroit, MI	41,029,661	45,322,534	45,387,832	4,292,873	4,358,171	10.5%	10.6%
Houston, TX	76,957,061	79,430,407	79,758,027	2,473,346	2,800,966	3.2%	3.6%
Indianapolis, IN	13,495,503	12,692,332	12,740,172	-803,171	-755,331	-6.0%	-5.6%
Jacksonville, FL	13,310,581	22,789,258	22,828,222	9,478,677	9,517,641	71.2%	71.5%
Kansas City, MO–KS	16,305,454	24,604,565	24,724,905	8,299,111	8,419,451	50.9%	51.6%
Las Vegas–Henderson, NV	34,802,410	38,018,933	38,036,888	3,216,523	3,234,478	9.2%	9.3%
Los Angeles–Long Beach–Anaheim, CA	300,863,182	220,990,487	220,997,230	-79,872,695	-79,865,952	-26.5%	-26.5%
Louisville/Jefferson County, KY–IN	13,896,577	11,487,326	11,554,543	-2,409,251	-2,342,034	-17.3%	-16.9%
Memphis, TN–MS–AR	10,318,625	19,211,043	19,435,612	8,892,418	9,116,987	86.2%	88.4%
Miami, FL	108,608,246	94,806,051	94,900,212	-13,802,195	-13,708,034	-12.7%	-12.6%
Milwaukee, WI	20,116,961	28,128,828	28,376,709	8,011,867	8,259,748	39.8%	41.1%
Minneapolis–St. Paul, MN–WI	54,842,322	55,899,637	56,232,339	1,057,315	1,390,017	1.9%	2.5%

* Bridgeport–Stamford, CT–NY is part of the large urban area with a population of less than 1M and is included in Table C4.

TABLE C3

Comparison of Current (FY19) and Future § 5307 Funding for Large Urban Areas with Population of 1M or More (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Nashville-Davidson, TN	22,542,344	21,205,512	21,280,647	-1,336,832	-1,261,697	-5.9%	-5.6%
New Orleans, LA	14,657,182	20,232,773	20,331,264	5,575,591	5,674,082	38.0%	38.7%
New York–Newark, NY–NJ–CT	808,359,426	650,372,512	672,060,065	-157,986,914	-136,299,361	-19.5%	-16.9%
Oklahoma City, OK	7,918,076	16,813,880	16,900,381	8,895,804	8,982,305	112.3%	113.4%
Orlando, FL	30,297,795	29,742,938	30,077,503	-554,857	-220,292	-1.8%	-0.7%
Philadelphia, PA–NJ–DE–MD	140,017,442	110,126,197	116,233,633	-29,891,245	-23,783,809	-21.3%	-17.0%
Phoenix–Mesa, AZ	52,882,111	55,844,024	56,054,148	2,961,913	3,172,037	5.6%	6.0%
Pittsburgh, PA	32,709,705	38,331,171	38,382,666	5,621,466	5,672,961	17.2%	17.3%
Portland, OR–WA	45,156,632	45,127,933	45,176,348	-28,699	19,716	-0.1%	0.0%
Providence, RI–MA	23,444,475	22,450,932	22,492,535	-993,543	-951,940	-4.2%	-4.1%
Raleigh, NC	11,850,766	10,532,590	10,958,225	-1,318,176	-892,541	-11.1%	-7.5%
Richmond, VA	11,719,577	9,933,428	9,979,666	-1,786,149	-1,739,911	-15.2%	-14.8%
Riverside–San Bernardino, CA	32,436,257	30,070,728	30,079,432	-2,365,529	-2,356,825	-7.3%	-7.3%
Sacramento, CA	25,329,918	28,675,389	28,857,631	3,345,471	3,527,713	13.2%	13.9%
Salt Lake City–West Valley City, UT	26,646,246	28,431,871	28,436,252	1,785,625	1,790,006	6.7%	6.7%
San Antonio, TX	29,951,497	28,091,181	28,435,769	-1,860,316	-1,515,728	-6.2%	-5.1%
San Diego, CA	67,595,517	59,923,547	59,943,903	-7,671,970	-7,651,614	-11.3%	-11.3%
San Francisco–Oakland, CA	138,804,053	106,851,884	106,970,578	-31,952,169	-31,833,475	-23.0%	-22.9%
San Jose, CA	36,480,904	32,405,860	32,407,510	-4,075,044	-4,073,394	-11.2%	-11.2%
Seattle, WA	105,604,370	91,718,804	91,890,764	-13,885,566	-13,713,606	-13.1%	-13.0%
St. Louis, MO–IL	34,351,735	38,682,777	38,810,743	4,331,042	4,459,008	12.6%	13.0%
Tampa–St. Petersburg, FL	28,698,906	36,750,747	36,840,773	8,051,841	8,141,867	28.1%	28.4%
Virginia Beach, VA	17,733,813	25,221,197	25,237,979	7,487,384	7,504,166	42.2%	42.3%
Washington, DC–VA–MD	171,679,291	143,668,830	143,735,736	-28,010,461	-27,943,555	-16.3%	-16.3%
TOTAL – LU W/ POP OF 1M+	3,379,732,488	3,001,864,482	3,063,481,815	-358,407,340	-316,250,673	-10.6%	-9.4%

TABLE C4

Comparison of Current (FY19) and Future § 5307 Funding for Large Urban Areas with Population of (200K–1M] (Assumes Same FTA Data Values)

Urban Area	§ 5307 Appropriation FY19	§ 5307 Forecast 75% 0 mi	§ 5307 Forecast 50% ½ mi	§ 5307 Forecast – FY19 Appropriation 75% 0 mi	§ 5307 Forecast – FY19 Appropriation 50% ½ mi	% Diff (Forecast – FY19) 75% 0 mi	% Diff (Forecast – FY19) 50% ½ mi
Aberdeen–Bel Air South–Bel Air North, MD	1,535,872	1,321,535	1,333,438	-214,337	-202,434	-14%	-13%
Akron, OH	7,386,461	6,623,203	6,652,114	-763,258	-734,347	-10%	-10%
Albany–Schenectady, NY	10,337,470	9,402,159	9,454,494	-935,311	-882,976	-9%	-9%
Albuquerque, NM	18,455,944	19,138,597	19,141,634	682,653	685,690	4%	4%
Allentown, PA–NJ	7,669,403	6,780,035	6,815,569	-889,368	-853,834	-12%	-11%
Amarillo, TX	3,200,793	932,132	953,132	-2,268,661	-2,247,661	-71%	-70%
Anchorage, AK	15,581,375	14,037,442	14,037,442	-1,543,933	-1,543,933	-10%	-10%
Ann Arbor, MI	6,997,149	6,525,796	6,539,440	-471,353	-457,709	-7%	-7%
Antioch, CA	6,265,137	15,296,864	15,299,240	9,031,727	9,034,103	144%	144%
Appleton, WI	2,381,315	2,042,761	2,050,809	-338,554	-330,506	-14%	-14%
Asheville, NC	2,682,276	2,791,047	2,862,825	108,771	180,549	4%	7%
Atlantic City, NJ	9,735,559	18,276,519	18,278,544	8,540,960	8,542,985	88%	88%
Augusta-Richmond County, GA–SC	2,635,928	2,439,800	2,494,396	-196,128	-141,532	-7%	-5%
Avondale–Goodyear, AZ	3,032,209	1,035,771	1,153,071	-1,996,438	-1,879,138	-66%	-62%
Bakersfield, CA	7,583,180	5,583,293	5,586,045	-1,999,887	-1,997,135	-26%	-26%
Barnstable Town, MA	6,259,733	15,304,666	15,315,068	9,044,933	9,055,335	144%	145%
Baton Rouge, LA	5,640,479	5,154,311	5,320,016	-486,168	-320,463	-9%	-6%
Birmingham, AL	6,606,267	6,109,967	6,190,789	-496,300	-415,478	-8%	-6%
Boise City, ID	4,242,303	3,527,851	3,534,463	-714,452	-707,840	-17%	-17%
Bonita Springs, FL	2,885,842	2,871,302	2,910,384	-14,540	24,542	-1%	1%
Bremerton, WA	2,499,412	892,454	938,053	-1,606,958	-1,561,359	-64%	-62%
Bridgeport–Stamford, CT–NY*	19,460,666	21,593,430		2,132,764	-19,460,666	11%	-100%
Brownsville, TX	2,415,759	1,907,824	1,922,504	-507,935	-493,255	-21%	-20%
Buffalo, NY	13,497,649	21,142,159	21,327,960	7,644,510	7,830,311	57%	58%
Canton, OH	3,689,186	3,371,504	3,379,904	-317,682	-309,282	-9%	-8%

*Bridgeport–Stamford, CT–NY grows to a large UA with population of more than 1M and is on Table C3 for the 50% scenario.

TABLE C4

Comparison of Current (FY19) and Future § 5307 Funding for Large Urban Areas with Population of (200K–1M] (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Cape Coral, FL	5,286,175	5,277,389	5,335,572	-8,786	49,397	0%	1%
Charleston–North Charleston, SC	5,445,476	4,979,962	5,034,276	-465,514	-411,200	-9%	-8%
Chattanooga, TN–GA	3,596,876	13,626,796	13,662,160	10,029,920	10,065,284	279%	280%
College Station–Bryan, TX*	2,862,891		856,498	-2,862,891	-2,006,393	-100%	-70%
Colorado Springs, CO	6,522,379	5,088,388	5,111,031	-1,433,991	-1,411,348	-22%	-22%
Columbia, SC	4,595,822	4,302,655	4,432,367	-293,167	-163,455	-6%	-4%
Columbus, GA–AL	3,778,265	3,582,596	3,611,466	-195,669	-166,799	-5%	-4%
Concord, CA	22,287,174	28,035,480	28,037,601	5,748,306	5,750,427	26%	26%
Concord, NC	1,881,707	1,804,150	1,857,408	-77,557	-24,299	-4%	-1%
Conroe–The Woodlands, TX	3,047,072	3,005,719	3,246,531	-41,353	199,459	-1%	7%
Corpus Christi, TX	5,369,050	4,662,692	4,696,060	-706,358	-672,990	-13%	-13%
Davenport, IA–IL	4,125,771	13,766,357	13,792,142	9,640,586	9,666,371	234%	234%
Dayton, OH	15,382,035	19,563,143	19,600,374	4,181,108	4,218,339	27%	27%
Deltona, FL*	2,648,804		982,025	-2,648,804	-1,666,779	-100%	-63%
Denton–Lewisville, TX	6,035,665	13,809,849	13,855,547	7,774,184	7,819,882	129%	130%
Des Moines, IA	6,088,524	5,426,282	5,449,633	-662,242	-638,891	-11%	-10%
Durham, NC	7,568,603	7,174,606	7,220,756	-393,997	-347,847	-5%	-5%
El Paso, TX–NM	13,168,279	10,793,133	10,823,168	-2,375,146	-2,345,111	-18%	-18%
Eugene, OR	7,798,477	16,656,052	16,663,276	8,857,575	8,864,799	114%	114%
Evansville, IN–KY	2,426,679	2,121,806	2,137,787	-304,873	-288,892	-13%	-12%
Fargo, ND–MN	2,887,390	875,950	882,844	-2,011,440	-2,004,546	-70%	-69%
Fayetteville, NC	3,058,932	2,862,576	2,911,073	-196,356	-147,859	-6%	-5%
Fayetteville–Springdale–Rogers, AR–MO	2,526,869	2,397,062	2,426,134	-129,807	-100,735	-5%	-4%
Flint, MI	6,258,934	5,855,901	5,874,481	-403,033	-384,453	-6%	-6%
Fort Collins, CO	4,159,303	13,560,462	13,579,236	9,401,159	9,419,933	226%	226%

*College Station–Bryan, TX, and Deltona, FL, do not grow to a large UA under the 75% scenario.

TABLE C4

Comparison of Current (FY19) and Future § 5307 Funding for Large Urban Areas with Population of (200K–1M] (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Fort Walton Beach–Navarre–Wright, FL	2,511,235	930,829	964,097	-1,580,406	-1,547,138	-63%	-62%
Fort Wayne, IN	2,944,921	2,548,679	2,564,431	-396,242	-380,490	-13%	-13%
Fresno, CA	10,278,598	7,739,378	7,750,691	-2,539,220	-2,527,907	-25%	-25%
Gainesville, FL*	2,942,624		899,090	-2,942,624	-2,043,534	-100%	-69%
Grand Rapids, MI	9,373,351	17,983,305	18,068,033	8,609,954	8,694,682	92%	93%
Green Bay, WI	2,010,191	1,713,006	1,721,614	-297,185	-288,577	-15%	-14%
Greensboro, NC	4,445,507	4,149,019	4,196,632	-296,488	-248,875	-7%	-6%
Greenville, SC	2,947,640	2,851,373	3,077,950	-96,267	130,310	-3%	4%
Gulfport, MS	2,064,468	2,075,197	2,092,639	10,729	28,171	1%	1%
Hagerstown, MD–WV–PA	2,279,744	905,734	939,232	-1,374,010	-1,340,512	-60%	-59%
Harrisburg, PA	6,091,045	14,786,807	14,803,824	8,695,762	8,712,779	143%	143%
Hartford, CT	15,498,285	23,826,768	23,843,016	8,328,483	8,344,731	54%	54%
Hickory, NC	1,454,305	1,504,249	1,566,430	49,944	112,125	3%	8%
Huntington, WV–KY–OH	2,124,765	1,986,025	2,019,179	-138,740	-105,586	-7%	-5%
Huntsville, AL	2,086,788	1,993,552	2,179,384	-93,236	92,596	-4%	4%
Indio–Cathedral City, CA	4,605,488	3,882,733	3,959,426	-722,755	-646,062	-16%	-14%
Jackson, MS	2,461,588	2,181,069	2,312,013	-280,519	-149,575	-11%	-6%
Kalamazoo, MI	2,992,366	2,789,108	2,848,910	-203,258	-143,456	-7%	-5%
Kennewick–Pasco, WA	6,250,085	5,999,162	6,017,525	-250,923	-232,560	-4%	-4%
Killeen, TX	2,102,789	1,680,674	1,697,471	-422,115	-405,318	-20%	-19%
Kissimmee, FL	5,661,493	5,671,072	5,683,147	9,579	21,654	0%	0%
Knoxville, TN	5,787,419	5,621,880	5,715,765	-165,539	-71,654	-3%	-1%
Lafayette, LA	2,145,059	2,016,425	2,124,783	-128,634	-20,276	-6%	-1%
Lakeland, FL	2,122,613	1,947,544	1,966,923	-175,069	-155,690	-8%	-7%
Lancaster, PA	7,958,742	14,886,578	14,929,227	6,927,836	6,970,485	87%	88%

* Gainesville, FL does not grow to a large UA under the 75% scenario.

TABLE C4

Comparison of Current (FY19) and Future § 5307 Funding for Large Urban Areas with Population of (200K–1M] (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Lancaster–Palmdale, CA	8,121,638	14,618,628	14,622,560	6,496,990	6,500,922	80%	80%
Lansing, MI	6,003,951	5,486,559	5,498,984	-517,392	-504,967	-9%	-8%
Laredo, TX	3,211,709	2,381,783	2,384,372	-829,926	-827,337	-26%	-26%
Lexington–Fayette, KY	4,390,200	3,462,818	3,472,564	-927,382	-917,636	-21%	-21%
Lincoln, NE	3,106,523	2,407,355	2,410,663	-699,168	-695,860	-23%	-22%
Little Rock, AR	4,447,622	14,206,395	14,220,205	9,758,773	9,772,583	219%	220%
Lorain–Elyria, OH*	2,573,950		1,038,559	-2,573,950	-1,535,391	-100%	-60%
Lubbock, TX	3,054,915	2,604,721	2,640,825	-450,194	-414,090	-15%	-14%
Madison, WI	7,638,764	16,417,533	16,439,058	8,778,769	8,800,294	115%	115%
Manchester, NH*	2,201,835		882,516	-2,201,835	-1,319,319	-100%	-60%
McAllen, TX	6,134,770	5,221,777	5,269,842	-912,993	-864,928	-15%	-14%
McKinney, TX	2,602,279	960,898	1,052,489	-1,641,381	-1,549,790	-63%	-60%
Mission Viejo–Lake Forest–San Clemente, CA	9,126,615	15,278,651	15,279,370	6,152,036	6,152,755	67%	67%
Mobile, AL	2,809,173	2,521,428	2,582,319	-287,745	-226,854	-10%	-8%
Modesto, CA	5,038,276	3,567,039	3,575,950	-1,471,237	-1,462,326	-29%	-29%
Montgomery, AL	2,381,200	2,083,267	2,113,754	-297,933	-267,446	-13%	-11%
Murrieta–Temecula–Menifee, CA	4,518,327	3,724,707	3,733,529	-793,620	-784,798	-18%	-17%
Myrtle Beach–Socastee, SC–NC	1,430,712	1,661,993	1,703,104	231,281	272,392	16%	19%
Nashua, NH–MA	1,478,591	1,342,650	1,392,132	-135,941	-86,459	-9%	-6%
New Haven, CT	16,804,976	20,307,088	20,316,893	3,502,112	3,511,917	21%	21%
Norwich–New London, CT–RI	1,717,657	1,547,618	1,556,813	-170,039	-160,844	-10%	-9%
Ogden–Layton, UT	12,073,034	18,395,244	18,410,201	6,322,210	6,337,167	52%	52%
Omaha, NE–IA	7,706,373	6,018,148	6,072,061	-1,688,225	-1,634,312	-22%	-21%
Oxnard, CA	9,297,121	15,430,826	15,436,316	6,133,705	6,139,195	66%	66%

* Lorain–Elyria, OH and Manchester, NH do not grow to a large UA under the 75% scenario.

TABLE C4

Comparison of Current (FY19) and Future § 5307 Funding for Large Urban Areas with Population of (200K–1M] (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Palm Bay–Melbourne, FL	5,040,688	4,561,829	4,600,623	-478,859	-440,065	-9%	-9%
Palm Coast–Daytona Beach–Port Orange, FL	4,519,302	4,269,598	4,330,560	-249,704	-188,742	-6%	-4%
Pensacola, FL–AL	3,170,984	2,984,458	3,051,926	-186,526	-119,058	-6%	-4%
Peoria, IL	3,328,725	2,949,097	2,978,791	-379,628	-349,934	-11%	-11%
Port St. Lucie, FL	3,002,069	2,745,739	2,764,761	-256,330	-237,308	-9%	-8%
Portland, ME	10,294,729	13,044,560	13,081,079	2,749,831	2,786,350	27%	27%
Poughkeepsie–Newburgh, NY–NJ	20,138,533	28,686,869	28,791,525	8,548,336	8,652,992	42%	43%
Provo–Orem, UT	8,138,726	15,348,545	15,403,931	7,209,819	7,265,205	89%	89%
Reading, PA	3,410,942	2,789,058	2,800,161	-621,884	-610,781	-18%	-18%
Reno, NV–CA	6,703,847	16,192,188	16,216,630	9,488,341	9,512,783	142%	142%
Roanoke, VA	2,593,590	2,399,784	2,421,640	-193,806	-171,950	-7%	-7%
Rochester, NY	8,690,291	7,357,388	7,387,445	-1,332,903	-1,302,846	-15%	-15%
Rockford, IL	2,913,732	2,461,773	2,475,254	-451,959	-438,478	-16%	-15%
Round Lake Beach–McHenry–Grayslake, IL–WI	4,978,522	12,817,027	12,855,393	7,838,505	7,876,871	157%	158%
Salem, OR	5,942,971	5,263,970	5,299,172	-679,001	-643,799	-11%	-11%
Salinas, CA*	3,913,695		843,046	-3,913,695	-3,070,649	-100%	-78%
Santa Barbara, CA	3,881,154	872,730	878,564	-3,008,424	-3,002,590	-78%	-77%
Santa Clarita, CA	4,790,953	13,339,407	13,349,189	8,548,454	8,558,236	178%	179%
Santa Rosa, CA	3,991,685	3,082,162	3,125,185	-909,523	-866,500	-23%	-22%
Sarasota–Bradenton, FL	7,572,223	7,255,072	7,313,893	-317,151	-258,330	-4%	-3%
Savannah, GA	3,463,471	13,460,447	13,513,340	9,996,976	10,049,869	289%	290%
Scranton, PA	4,490,894	3,792,444	3,801,500	-698,450	-689,394	-16%	-15%
Shreveport, LA	3,575,017	3,301,225	3,318,409	-273,792	-256,608	-8%	-7%
Sioux Falls, SD*	2,517,459		825,798	-2,517,459	-1,691,661	-100%	-67%

* Salinas, CA, and Sioux Falls, SD, do not grow to a large UA under the 75% scenario.

TABLE C4

Comparison of Current (FY19) and Future § 5307 Funding for Large Urban Areas with Population of (200K–1M] (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
South Bend, IN–MI	3,937,268	12,698,696	12,711,264	8,761,428	8,773,996	223%	223%
Spartanburg, SC	2,047,572	905,701	982,465	-1,141,871	-1,065,107	-56%	-52%
Spokane, WA	7,695,565	6,989,887	6,996,157	-705,678	-699,408	-9%	-9%
Springfield, MA–CT	8,587,556	7,830,670	7,851,543	-756,886	-736,013	-9%	-9%
Springfield, MO	2,397,699	2,088,681	2,141,076	-309,018	-256,623	-13%	-11%
Stockton, CA	7,320,446	13,600,594	13,614,281	6,280,148	6,293,835	86%	86%
Syracuse, NY	5,196,752	4,462,876	4,471,508	-733,876	-725,244	-14%	-14%
Tallahassee, FL	2,928,012	2,562,624	2,617,844	-365,388	-310,168	-12%	-11%
Thousand Oaks, CA	2,742,471	11,838,986	11,847,821	9,096,515	9,105,350	332%	332%
Toledo, OH–MI	6,377,295	15,680,925	15,716,214	9,303,630	9,338,919	146%	146%
Trenton, NJ	9,662,607	16,073,903	16,075,105	6,411,296	6,412,498	66%	66%
Tucson, AZ	14,587,852	22,918,141	23,108,629	8,330,289	8,520,777	57%	58%
Tulsa, OK	6,189,272	5,397,957	5,599,606	-791,315	-589,666	-13%	-10%
Urban Honolulu, HI	27,322,881	33,452,311	33,521,928	6,129,430	6,199,047	22%	23%
Victorville–Hesperia, CA	7,793,840	7,222,852	7,235,981	-570,988	-557,859	-7%	-7%
Visalia, CA	5,558,718	4,842,457	4,852,742	-716,261	-705,976	-13%	-13%
Waco, TX*	2,561,739		883,225	-2,561,739	-1,678,514	-100%	-66%
Wichita, KS	4,346,546	3,477,161	3,498,009	-869,385	-848,537	-20%	-20%
Wilmington, NC	2,149,241	2,051,296	2,066,117	-97,945	-83,124	-5%	-4%
Winston-Salem, NC	4,560,128	4,415,389	4,472,126	-144,739	-88,002	-3%	-2%
Winter Haven, FL	1,534,845	1,690,699	1,546,518	155,854	11,673	10%	1%
Worcester, MA–CT	5,531,604	14,279,461	14,389,408	8,747,857	8,857,804	158%	160%
York, PA	2,942,865	2,678,208	2,685,546	-264,657	-257,319	-9%	-9%
Youngstown, OH–PA	3,804,442	3,373,242	3,395,088	-431,200	-409,354	-11%	-11%
LU (200K–1M] TOTAL	839,337,257	1,044,156,803	1,035,325,304	204,819,546	195,988,047	24%	23%

* Waco, TX, does not grow to a large UA under the 75% scenario.

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Abilene, TX	1,665,452	2,002,373	1,612,746	336,921	-52,706	20%	-3%
Albany, GA	1,248,067	1,395,280	1,376,371	147,213	128,304	12%	10%
Albany, OR	920,160	1,088,213	887,885	168,053	-32,275	18%	-4%
Alexandria, LA	1,048,265	1,327,580	1,291,127	279,315	242,862	27%	23%
Alton, IL–MO	1,104,778	1,174,489	1,077,746	69,711	-27,032	6%	-2%
Altoona, PA	1,217,359	1,431,188	1,436,256	213,829	218,897	18%	18%
Ames, IA	1,041,553	2,476,530	2,194,173	1,434,977	1,152,620	138%	111%
Anderson, IN	1,112,092	1,253,255	1,215,565	141,163	103,473	13%	9%
Anderson, SC	874,749	1,120,163	1,098,923	245,414	224,174	28%	26%
Anniston–Oxford, AL	902,288	1,338,597	1,340,133	436,309	437,845	48%	49%
Arroyo Grande–Grover Beach, CA	795,891	1,749,190	1,900,219	953,299	1,104,328	120%	139%
Athens–Clarke County, GA	1,674,247	2,936,877	2,854,876	1,262,630	1,180,629	75%	71%
Auburn, AL	1,024,526	1,495,046	1,335,054	470,520	310,528	46%	30%
Bangor, ME	797,878	1,436,393	1,402,976	638,515	605,098	80%	76%
Battle Creek, MI	1,031,837	1,448,165	1,372,806	416,328	340,969	40%	33%
Bay City, MI	989,937	1,373,021	1,312,552	383,084	322,615	39%	33%
Beaufort–Port Royal, SC	-	771,169	781,230	771,169	781,230	-	-
Beaumont, TX	2,009,112	2,420,196	2,140,685	411,084	131,573	20%	7%
Beckley, WV	744,520	968,025	1,005,561	223,505	261,041	30%	35%
Belgrade, MT	-	-	904,951	-	904,951	-	-
Bellingham, WA	1,849,599	3,254,092	3,038,700	1,404,493	1,189,101	76%	64%
Beloit, WI–IL	920,128	1,016,799	914,338	96,671	-5,790	11%	-1%
Bend, OR	1,260,055	1,691,084	1,541,788	431,029	281,733	34%	22%
Benton Harbor–St. Joseph–Fair Plain, MI	769,591	1,143,704	1,118,817	374,113	349,226	49%	45%
Billings, MT	1,739,633	2,197,495	2,226,323	457,862	486,690	26%	28%

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Binghamton, NY–PA	2,410,112	3,116,354	3,124,063	706,242	713,951	29%	30%
Bismarck, ND	1,209,862	2,342,107	2,082,729	1,132,245	872,867	94%	72%
Blacksburg, VA	1,254,458	2,532,362	2,415,878	1,277,904	1,161,420	102%	93%
Bloomington, IN	1,807,579	2,865,973	2,786,991	1,058,394	979,412	59%	54%
Bloomington–Normal, IL	2,256,103	3,479,668	2,922,218	1,223,565	666,115	54%	30%
Bloomsburg–Berwick, PA	726,543	844,916	850,377	118,373	123,834	16%	17%
Boulder, CO	2,294,257	4,331,551	3,659,501	2,037,294	1,365,244	89%	60%
Bowling Green, KY	1,108,029	1,482,285	1,331,358	374,256	223,329	34%	20%
Bozeman, MT	-	941,637	-	941,637	-		
Bristol–Bristol, TN–VA	815,360	1,017,466	1,029,659	202,106	214,299	25%	26%
Brunswick, GA	631,488	798,074	763,391	166,586	131,903	26%	21%
Bullhead City, AZ–NV	-	889,465	-	889,465	-		
Burlington, NC	1,520,203	2,548,547	2,439,512	1,028,344	919,309	68%	60%
Burlington, VT	1,494,473	2,875,349	2,938,642	1,380,876	1,444,169	92%	97%
Camarillo, CA	1,328,129	1,530,011	1,184,140	201,882	-143,989	15%	-11%
Cape Girardeau, MO–IL	699,137	1,366,826	1,280,481	667,689	581,344	96%	83%
Carbondale, IL	885,742	1,542,329	1,596,024	656,587	710,282	74%	80%
Carson City, NV	963,289	1,594,975	1,345,878	631,686	382,589	66%	40%
Cartersville, GA	604,401	1,322,543	1,297,097	718,142	692,696	119%	115%
Casa Grande, AZ	829,314	1,421,137	1,120,871	591,823	291,557	71%	35%
Casper, WY	966,591	1,432,999	1,352,022	466,408	385,431	48%	40%
Cedar Rapids, IA	2,647,833	3,158,375	2,823,984	510,542	176,151	19%	7%
Chambersburg, PA	631,986	795,011	800,926	163,025	168,940	26%	27%
Champaign, IL	2,734,066	4,462,048	3,710,601	1,727,982	976,535	63%	36%
Charleston, WV	2,018,958	2,918,238	2,928,406	899,280	909,448	45%	45%

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	FY19	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi
Charlottesville, VA	1,571,856	2,766,730	2,538,544	1,194,874	966,688	76%	61%
Cheyenne, WY	1,090,927	1,359,151	1,321,948	268,224	231,021	25%	21%
Chico, CA	1,771,536	2,603,808	2,482,282	832,272	710,746	47%	40%
Clarksville, TN–KY	2,061,780	2,965,336	2,807,703	903,556	745,923	44%	36%
Cleveland, TN	822,667	1,102,699	1,075,811	280,032	253,144	34%	31%
Clovis, NM	-	-	850,203	-	850,203		
Coeur d'Alene, ID	1,468,154	2,013,131	1,926,915	544,977	458,761	37%	31%
College Station–Bryan, TX	-	3,603,455	-	3,603,455	-		
Columbia, MO	1,875,838	2,974,042	2,696,602	1,098,204	820,764	59%	44%
Columbus, IN	807,416	1,083,129	853,172	275,713	45,756	34%	6%
Conway, AR	898,185	1,239,398	1,243,249	341,213	345,064	38%	38%
Cookeville, TN	-	-	691,857	-	691,857		
Corvallis, OR	1,147,927	2,656,660	2,393,335	1,508,733	1,245,408	131%	108%
Cumberland, MD–WV–PA	695,960	837,200	804,880	141,240	108,920	20%	16%
Dalton, GA	1,018,323	1,273,110	1,301,521	254,787	283,198	25%	28%
Danbury, CT–NY	7,490,579	3,964,666	3,976,964	-3,525,913	-3,513,615	-47%	-47%
Danville, IL	-	-	702,304	-	702,304		
Daphne–Fairhope, AL	643,255	1,563,667	1,669,245	920,412	1,025,990	143%	159%
Davis, CA	1,890,510	3,708,201	3,172,636	1,817,691	1,282,126	96%	68%
Decatur, AL	862,013	1,051,579	1,033,675	189,566	171,662	22%	20%
Decatur, IL	1,259,222	2,167,351	1,997,098	908,129	737,876	72%	59%
DeKalb, IL	1,174,401	1,321,376	1,034,472	146,975	-139,929	13%	-12%
Delano, CA	1,487,583	2,119,809	1,459,590	632,226	-27,993	43%	-2%
Deltona, FL	-	3,349,611	-	3,349,611	-		
Dothan, AL	858,971	1,082,671	1,046,822	223,700	187,851	26%	22%

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	FY19	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi
Dover, DE	1,428,623	2,605,033	2,808,311	1,176,410	1,379,688	82%	97%
Dover–Rochester, NH–ME	1,070,043	1,556,643	1,546,728	486,600	476,685	45%	45%
Dubuque, IA–IL	990,867	1,463,386	1,297,011	472,519	306,144	48%	31%
Duluth, MN–WI	1,663,043	2,933,838	2,813,259	1,270,795	1,150,216	76%	69%
Eagle Pass, TX	-	1,033,411	1,041,396	1,033,411	1,041,396		
East Stroudsburg, PA–NJ	617,681	1,030,371	1,139,893	412,690	522,212	67%	85%
Eau Claire, WI	1,330,484	2,138,446	2,040,338	807,962	709,854	61%	53%
El Centro–Calexico, CA	2,226,423	4,049,127	3,433,064	1,822,704	1,206,641	82%	54%
El Paso de Robles (Paso Robles)–Atascadero, CA	957,202	2,224,525	2,127,419	1,267,323	1,170,217	132%	122%
Elizabethtown–Radcliff, KY	906,953	1,711,034	1,637,616	804,081	730,663	89%	81%
Elkhart, IN–MI	1,926,787	2,381,886	2,211,498	455,099	284,711	24%	15%
Elmira, NY	953,991	1,069,893	1,077,351	115,902	123,360	12%	13%
Enid, OK	-	-	832,671	-	832,671		
Erie, PA	3,180,265	4,322,413	4,326,632	1,142,148	1,146,367	36%	36%
Fairbanks, AK	742,293	1,438,424	1,438,424	696,131	696,131	94%	94%
Fairfield, CA	2,591,168	3,157,110	2,896,939	565,942	305,771	22%	12%
Farmington, NM	693,871	804,783	1,024,565	110,912	330,694	16%	48%
Flagstaff, AZ	1,082,819	2,643,220	2,356,255	1,560,401	1,273,436	144%	118%
Florence, AL	946,798	1,171,739	1,129,697	224,941	182,899	24%	19%
Florence, SC	1,112,285	1,393,024	1,328,865	280,739	216,580	25%	19%
Fond du Lac, WI	782,680	898,283	788,869	115,603	6,189	15%	1%
Fort Smith, AR–OK	1,759,263	2,173,284	2,036,292	414,021	277,029	24%	16%
Frederick, MD	1,981,012	2,597,369	2,476,667	616,357	495,655	31%	25%
Fredericksburg, VA	1,935,763	3,176,171	2,994,054	1,240,408	1,058,291	64%	55%
Gadsden, AL	717,753	868,008	856,781	150,255	139,028	21%	19%

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	FY19	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi
Gainesville, FL	-	4,700,098	-	4,700,098	-		
Gainesville, GA	1,543,006	2,443,793	2,451,740	900,787	908,734	58%	59%
Gastonia, NC–SC	2,082,756	2,624,919	2,576,369	542,163	493,613	26%	24%
Gilroy–Morgan Hill, CA	1,486,911	2,010,050	1,819,491	523,139	332,580	35%	22%
Glens Falls, NY	853,979	1,033,272	1,037,494	179,293	183,515	21%	21%
Goldsboro, NC	745,924	947,125	987,784	201,201	241,860	27%	32%
Grand Forks, ND–MN	1,013,968	1,553,557	1,255,517	539,589	241,549	53%	24%
Grand Island, NE	711,827	852,305	687,158	140,478	-24,669	20%	-3%
Grand Junction, CO	1,731,135	2,090,600	1,973,347	359,465	242,212	21%	14%
Grants Pass, OR	746,692	937,592	907,394	190,900	160,702	26%	22%
Great Falls, MT	985,301	1,154,362	1,069,576	169,061	84,275	17%	9%
Greeley, CO	2,112,891	2,871,409	2,342,235	758,518	229,344	36%	11%
Greenville, NC	1,712,133	2,247,291	2,048,541	535,158	336,408	31%	20%
Hammond, LA	760,041	1,071,347	1,101,224	311,306	341,183	41%	45%
Hanford, CA	1,676,929	3,185,975	2,786,892	1,509,046	1,109,963	90%	66%
Hanover, PA	925,729	1,130,924	1,149,268	205,195	223,539	22%	24%
Harlingen, TX	1,961,169	2,400,890	2,193,871	439,721	232,702	22%	12%
Harrisonburg, VA	1,016,726	2,354,356	2,202,792	1,337,630	1,186,066	132%	117%
Hattiesburg, MS	987,991	1,269,404	1,193,131	281,413	205,140	28%	21%
Hazleton, PA	815,966	955,964	954,297	139,998	138,331	17%	17%
Helena, MT	-	-	785,535	-	785,535		
Hemet, CA	3,239,783	3,909,402	3,824,241	669,619	584,458	21%	18%
High Point, NC	2,195,454	2,997,275	2,944,131	801,821	748,677	37%	34%
Hilton Head Island, SC	763,685	1,117,958	1,352,809	354,273	589,124	46%	77%
Hinesville, GA	707,151	854,261	846,707	147,110	139,556	21%	20%

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Holland, MI	1,345,253	1,624,191	1,520,153	278,938	174,900	21%	13%
Homosassa Springs–Beverly Hills–Citrus Springs, FL	904,946	1,607,854	1,890,934	702,908	985,988	78%	109%
Hot Springs, AR	688,073	911,275	929,246	223,202	241,173	32%	35%
Houma, LA	1,956,364	2,600,453	2,558,310	644,089	601,946	33%	31%
Idaho Falls, ID	1,348,789	1,691,360	1,540,787	342,571	191,998	25%	14%
Iowa City, IA	1,711,748	3,260,586	2,855,762	1,548,838	1,144,014	90%	67%
Ithaca, NY	833,438	2,010,479	2,011,236	1,177,041	1,177,798	141%	141%
Jackson, MI	1,210,560	1,390,627	1,329,394	180,067	118,834	15%	10%
Jackson, TN	928,574	1,396,972	1,315,536	468,398	386,962	50%	42%
Jacksonville, NC	1,356,865	1,892,201	1,846,779	535,336	489,914	39%	36%
Janesville, WI	1,081,797	1,253,298	1,089,181	171,501	7,384	16%	1%
Jefferson City, MO	746,173	902,482	821,896	156,309	75,723	21%	10%
Johnson City, TN	1,425,653	1,822,422	1,818,686	396,769	393,033	28%	28%
Johnstown, PA	972,054	1,571,843	1,584,234	599,789	612,180	62%	63%
Jonesboro, AR	850,127	1,275,675	1,288,560	425,548	438,433	50%	52%
Joplin, MO	1,024,709	1,386,642	1,282,714	361,933	258,005	35%	25%
Kahului, HI	1,068,731	2,634,787	2,831,971	1,566,056	1,763,240	147%	165%
Kailua (Honolulu County)–Kaneohe, HI	1,959,242	2,431,727	2,033,069	472,485	73,827	24%	4%
Kankakee, IL	1,260,767	2,191,607	1,950,709	930,840	689,942	74%	55%
Kenosha, WI–IL	2,008,018	2,535,145	2,278,682	527,127	270,664	26%	13%
Kingsport, TN–VA	1,191,701	1,515,024	1,518,649	323,323	326,948	27%	27%
Kingston, NY	707,653	833,711	850,801	126,058	143,148	18%	20%
Kokomo, IN	865,681	995,054	983,624	129,373	117,943	15%	14%
La Crosse, WI–MN	1,472,558	2,218,685	2,064,308	746,127	591,750	51%	40%
Lady Lake–The Villages, FL	1,466,216	2,797,002	2,520,169	1,330,786	1,053,953	91%	72%

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	FY19	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi
Lafayette, IN	2,378,379	4,041,475	3,777,130	1,663,096	1,398,751	70%	59%
Lafayette–Louisville–Erie, CO	1,125,731	1,630,629	1,409,908	504,898	284,177	45%	25%
Lake Charles, LA	1,716,888	2,120,947	2,056,309	404,059	339,421	24%	20%
Lake Havasu City, AZ	750,524	1,006,529	859,311	256,005	108,787	34%	14%
Lake Jackson–Angleton, TX	1,041,578	1,272,136	1,038,052	230,558	-3,526	22%	0%
Lakes–Knik-Fairview–Wasilla, AK	-	669,426	722,497	669,426	722,497		
Las Cruces, NM	1,959,239	2,302,346	2,254,958	343,107	295,719	18%	15%
Laughlin, NV	-	-	909,568	-	909,568		
Lawrence, KS	1,580,780	2,679,650	2,366,237	1,098,870	785,457	70%	50%
Lawton, OK	1,456,415	1,615,354	1,442,122	158,939	-14,293	11%	-1%
Lebanon, PA	1,051,578	1,295,205	1,320,400	243,627	268,822	23%	26%
Lee’s Summit, MO	1,219,460	1,525,349	1,324,386	305,889	104,926	25%	9%
Leesburg–Eustis–Tavares, FL	1,677,888	2,341,816	2,280,916	663,928	603,028	40%	36%
Leominster–Fitchburg, MA	1,635,038	2,385,997	2,388,730	750,959	753,692	46%	46%
Lewiston, ID–WA	735,235	884,848	825,292	149,613	90,057	20%	12%
Lewiston, ME	817,434	942,390	874,679	124,956	57,245	15%	7%
Lexington Park–California–Chesapeake Ranch Estates, MD	672,615	1,170,761	1,183,010	498,146	510,395	74%	76%
Lima, OH	935,580	1,326,473	1,283,672	390,893	348,092	42%	37%
Livermore, CA	1,530,698	1,895,691	1,690,345	364,993	159,647	24%	10%
Lodi, CA	1,578,795	1,811,331	1,900,922	232,536	322,127	15%	20%
Logan, UT	1,463,833	2,151,469	1,919,702	687,636	455,869	47%	31%
Lompoc, CA	1,262,991	1,481,524	1,410,988	218,533	147,997	17%	12%
Longmont, CO	1,781,183	2,596,068	2,611,017	814,885	829,834	46%	47%
Longview, TX	1,207,407	1,537,696	1,451,185	330,289	243,778	27%	20%
Longview, WA–OR	948,910	1,349,163	1,303,322	400,253	354,412	42%	37%

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Lorain–Elyria, OH	-	2,915,100	-	2,915,100	-		
Los Lunas, NM	722,092	913,652	918,611	191,560	196,519	27%	27%
Lynchburg, VA	1,452,236	2,668,951	2,662,227	1,216,715	1,209,991	84%	83%
Macon, GA	1,827,667	2,573,211	2,504,189	745,544	676,522	41%	37%
Madera, CA	1,620,842	2,442,075	2,023,801	821,233	402,959	51%	25%
Manchester, NH	-	2,529,228	-	2,529,228	-		
Mandeville–Covington, LA	1,070,408	1,546,804	1,429,622	476,396	359,214	45%	34%
Manhattan, KS	938,604	1,298,186	962,374	359,582	23,770	38%	3%
Mankato, MN	890,440	928,720	860,782	38,280	-29,658	4%	-3%
Mansfield, OH	988,787	1,085,915	1,024,247	97,128	35,460	10%	4%
Manteca, CA	1,746,879	2,953,838	2,464,161	1,206,959	717,282	69%	41%
Maricopa, AZ	-	1,171,841	1,139,416	1,171,841	1,139,416		
Marysville, WA	1,962,918	2,630,056	2,621,243	667,138	658,325	34%	34%
Mauldin–Simpsonville, SC	1,491,590	2,249,526	2,139,627	757,936	648,037	51%	43%
Medford, OR	2,516,162	3,154,918	2,812,342	638,756	296,180	25%	12%
Merced, CA	2,533,974	3,561,306	3,241,393	1,027,332	707,419	41%	28%
Michigan City–La Porte, IN–MI	915,573	1,089,232	1,037,612	173,659	122,039	19%	13%
Middletown, NY	826,663	1,015,157	1,025,294	188,494	198,631	23%	24%
Middletown, OH	1,360,617	1,510,994	1,483,604	150,377	122,987	11%	9%
Midland, MI	713,382	1,144,045	1,087,067	430,663	373,685	60%	52%
Midland, TX	1,791,436	2,390,757	2,115,635	599,321	324,199	33%	18%
Minot, ND	-	1,011,600	956,558	1,011,600	956,558		
Missoula, MT	1,175,041	2,229,996	2,165,288	1,054,955	990,247	90%	84%
Monessen–California, PA	851,416	1,265,603	1,299,272	414,187	447,856	49%	53%
Monroe, LA	1,547,211	1,816,683	1,789,215	269,472	242,004	17%	16%

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	FY19	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi
Monroe, MI	688,588	1,286,040	1,262,140	597,452	573,552	87%	83%
Morehead City, NC	-	-	702,384	-	702,384		
Morgantown, WV	1,034,057	2,165,261	2,156,025	1,131,204	1,121,968	109%	109%
Morristown, TN	687,736	853,483	905,351	165,747	217,615	24%	32%
Mount Vernon, WA	903,069	1,880,113	1,783,011	977,044	879,942	108%	97%
Muncie, IN	1,350,345	2,038,752	1,977,824	688,407	627,479	51%	46%
Murfreesboro, TN	1,833,136	2,885,099	2,740,267	1,051,963	907,131	57%	49%
Muskegon, MI	2,081,949	2,444,320	2,428,227	362,371	346,278	17%	17%
Nampa, ID	2,397,017	3,340,029	2,909,180	943,012	512,163	39%	21%
Napa, CA	1,573,642	2,866,140	2,646,080	1,292,498	1,072,438	82%	68%
New Bedford, MA	2,577,908	3,018,416	2,982,232	440,508	404,324	17%	16%
New Bern, NC	591,280	747,918	1,041,470	156,638	450,190	26%	76%
Newark, OH	1,081,879	1,328,187	1,232,230	246,308	150,351	23%	14%
Norman, OK	1,651,451	2,428,836	2,152,277	777,385	500,826	47%	30%
North Port–Port Charlotte, FL	2,163,800	3,098,998	2,885,488	935,198	721,688	43%	33%
Ocala, FL	2,015,958	2,761,271	2,624,430	745,313	608,472	37%	30%
Odessa, TX	1,916,391	2,701,601	2,152,410	785,210	236,019	41%	12%
Olympia–Lacey, WA	2,365,100	4,131,528	4,081,212	1,766,428	1,716,112	75%	73%
Oshkosh, WI	1,200,616	1,613,545	1,481,066	412,929	280,450	34%	23%
Owensboro, KY	1,075,117	1,811,210	1,629,774	736,093	554,657	68%	52%
Paducah, KY–IL	-	693,965	698,449	693,965	698,449		
Panama City, FL	1,903,395	2,459,879	2,184,556	556,484	281,161	29%	15%
Parkersburg, WV–OH	907,248	1,068,131	1,053,965	160,883	146,717	18%	16%
Pascagoula, MS	634,229	1,218,359	1,196,957	584,130	562,728	92%	89%
Petaluma, CA	1,136,707	1,377,294	1,150,927	240,587	14,220	21%	1%

TABLE C5

Comparison of Current (FY19) and Future 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Pittsfield, MA	821,051	1,444,053	1,737,420	623,002	916,369	76%	112%
Pocatello, ID	1,103,220	1,288,692	1,155,061	185,472	51,841	17%	5%
Port Arthur, TX	1,979,404	2,358,490	2,079,759	379,086	100,355	19%	5%
Port Huron, MI	1,121,515	2,265,547	2,251,134	1,144,032	1,129,619	102%	101%
Porterville, CA	1,456,001	2,709,318	2,380,202	1,253,317	924,201	86%	63%
Portsmouth, NH–ME	926,389	1,174,267	1,195,476	247,878	269,087	27%	29%
Pottstown, PA	1,306,240	1,625,759	1,635,653	319,519	329,413	24%	25%
Prescott Valley–Prescott, AZ	1,149,843	1,620,005	1,410,151	470,162	260,308	41%	23%
Pueblo, CO	1,981,436	2,363,399	2,181,702	381,963	200,266	19%	10%
Racine, WI	2,286,292	2,439,728	2,288,857	153,436	2,565	7%	0%
Rapid City, SD	1,175,469	1,545,375	1,285,716	369,906	110,247	31%	9%
Redding, CA	1,624,169	1,917,502	1,949,402	293,333	325,233	18%	20%
Reedley–Dinuba, CA	-	1,355,153	1,338,763	1,355,153	1,338,763		
Rio Grande City–Roma, TX	-	990,089	986,719	990,089	986,719		
Rochester, MN	1,601,817	2,762,620	2,559,383	1,160,803	957,566	72%	60%
Rock Hill, SC	1,220,576	1,642,969	1,831,245	422,393	610,669	35%	50%
Rocky Mount, NC	916,227	1,306,252	1,224,094	390,025	307,867	43%	34%
Rome, GA	765,477	1,956,737	1,941,604	1,191,260	1,176,127	156%	154%
Roswell, NM	-	-	823,725	-	823,725		
Saginaw, MI	1,810,903	2,185,850	2,081,979	374,947	271,076	21%	15%
Sahuarita–Green Valley, AZ	-	-	825,427	-	825,427		
Salinas, CA	-	5,510,418	-	5,510,418	-		
Salisbury, MD–DE	1,254,522	2,380,709	2,352,297	1,126,187	1,097,775	90%	88%
San Angelo, TX	1,371,084	1,688,708	1,393,005	317,624	21,921	23%	2%
San Luis Obispo, CA	1,072,489	2,786,567	2,537,750	1,714,078	1,465,261	160%	137%

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
San Marcos, TX	830,113	2,437,908	2,285,495	1,607,795	1,455,382	194%	175%
Santa Cruz, CA	2,837,032	4,913,633	4,640,124	2,076,601	1,803,092	73%	64%
Santa Fe, NM	1,230,908	2,049,082	2,056,532	818,174	825,624	66%	67%
Santa Maria, CA	3,076,557	3,522,923	2,861,033	446,366	-215,524	15%	-7%
Saratoga Springs, NY	778,802	1,017,338	1,027,568	238,536	248,766	31%	32%
Seaside–Monterey, CA	2,029,566	3,444,597	3,248,150	1,415,031	1,218,584	70%	60%
Sebastian–Vero Beach South–Florida Ridge, FL	1,963,278	2,676,144	2,462,920	712,866	499,642	36%	25%
Sebring–Avon Park, FL	785,158	1,054,344	978,860	269,186	193,702	34%	25%
Sheboygan, WI	1,065,765	1,173,720	1,053,574	107,955	-12,191	10%	-1%
Sherman, TX	872,755	1,304,645	1,151,989	431,890	279,234	49%	32%
Sierra Vista, AZ	724,249	923,676	761,591	199,427	37,342	28%	5%
Simi Valley, CA	2,625,241	3,028,277	2,889,692	403,036	264,451	15%	10%
Sioux City, IA–NE–SD	1,558,458	1,720,860	1,480,196	162,402	-78,262	10%	-5%
Sioux Falls, SD	-	3,559,375	-	3,559,375	-		
Slidell, LA	1,205,416	1,514,744	1,469,060	309,328	263,644	26%	22%
South Lyon–Howell, MI	1,346,432	2,006,313	2,043,596	659,881	697,164	49%	52%
Spring Hill, FL	1,828,601	2,732,240	2,651,496	903,639	822,895	49%	45%
Springfield, IL	2,228,815	2,841,725	2,538,201	612,910	309,386	27%	14%
Springfield, OH	1,206,630	1,361,672	1,279,173	155,042	72,543	13%	6%
St. Augustine, FL	927,394	1,311,834	1,190,728	384,440	263,334	41%	28%
St. Cloud, MN	1,718,414	2,754,778	2,440,099	1,036,364	721,685	60%	42%
St. George, UT	1,525,247	2,356,589	2,262,935	831,342	737,688	55%	48%
St. Joseph, MO–KS	1,187,661	1,610,366	1,437,159	422,705	249,498	36%	21%
State College, PA	1,613,613	3,407,390	3,366,392	1,793,777	1,752,779	111%	109%
Staunton–Waynesboro, VA	728,453	947,257	853,011	218,804	124,558	30%	17%

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Stillwater, OK	-	-	896,600	-	896,600		
Sumter, SC	870,749	1,106,195	1,071,453	235,446	200,704	27%	23%
Temple, TX	1,237,833	1,690,207	1,456,923	452,374	219,090	37%	18%
Terre Haute, IN	1,319,858	1,560,233	1,431,153	240,375	111,295	18%	8%
Texarkana–Texarkana, TX–AR	969,544	1,170,657	1,134,023	201,113	164,479	21%	17%
Texas City, TX	1,369,129	1,732,190	1,561,273	363,061	192,144	27%	14%
Titusville, FL	767,859	1,186,562	1,135,801	418,703	367,942	55%	48%
Topeka, KS	2,148,951	2,465,839	2,204,142	316,888	55,191	15%	3%
Tracy, CA	1,837,089	2,784,440	2,089,203	947,351	252,114	52%	14%
Traverse City, MI	-	674,556	685,668	674,556	685,668		
Turlock, CA	2,133,605	2,468,995	2,012,569	335,390	-121,036	16%	-6%
Tuscaloosa, AL	1,867,821	2,393,451	2,245,936	525,630	378,115	28%	20%
Twin Falls, ID	-	1,119,246	1,090,944	1,119,246	1,090,944		
Twin Rivers–Hightstown, NJ	861,818	1,076,254	1,079,753	214,436	217,935	25%	25%
Tyler, TX	1,705,730	2,239,219	2,069,223	533,489	363,493	31%	21%
Uniontown–Connellsville, PA	649,521	1,285,294	1,307,165	635,773	657,644	98%	101%
Utica, NY	1,697,100	1,940,546	1,960,863	243,446	263,763	14%	16%
Vacaville, CA	1,777,453	2,585,828	2,318,020	808,375	540,567	45%	30%
Valdosta, GA	1,024,294	1,257,182	1,204,974	232,888	180,680	23%	18%
Vallejo, CA	3,517,573	4,338,503	3,871,113	820,930	353,540	23%	10%
Victoria, TX	987,194	1,761,822	1,500,705	774,628	513,511	78%	52%
Villas, NJ	657,906	779,544	781,379	121,638	123,473	18%	19%
Vineland, NJ	1,263,177	1,521,206	1,526,283	258,029	263,106	20%	21%
Waco, TX	-	3,231,146	-	3,231,146	-		
Waldorf, MD	1,414,104	1,974,099	1,870,104	559,995	456,000	40%	32%

TABLE C5

Comparison of Current (FY19) and Future § 5307 Funding for Small Urban Areas (Assumes Same FTA Data Values) (Continued)

	§ 5307 Appropriation	§ 5307 Forecast		§ 5307 Forecast – FY19 Appropriation		% Diff (Forecast – FY19)	
Urban Area	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Walla Walla, WA–OR	829,386	1,489,118	1,391,064	659,732	561,678	80%	68%
Warner Robins, GA	1,676,792	2,720,081	2,537,309	1,043,289	860,517	62%	51%
Waterbury, CT	8,488,289	4,779,102	4,781,643	(3,709,187)	(3,706,646)	-44%	-44%
Waterloo, IA	1,604,739	1,908,066	1,702,558	303,327	97,819	19%	6%
Watertown, NY	743,530	907,178	909,395	163,648	165,865	22%	22%
Watsonville, CA	1,423,095	2,708,043	2,409,307	1,284,948	986,212	90%	69%
Wausau, WI	989,878	1,168,191	1,082,226	178,313	92,348	18%	9%
Weirton–Steubenville, WV–OH–PA	904,359	1,036,873	1,032,167	132,514	127,808	15%	14%
Wenatchee, WA	1,024,442	2,570,962	2,444,707	1,546,520	1,420,265	151%	139%
West Bend, WI	918,661	1,648,824	1,533,497	730,163	614,836	79%	67%
Westminster–Eldersburg, MD	834,683	996,382	986,942	161,699	152,259	19%	18%
Wheeling, WV–OH	1,130,657	1,278,391	1,256,663	147,734	126,006	13%	11%
Wichita Falls, TX	1,465,447	1,771,442	1,509,023	305,995	43,576	21%	3%
Williamsburg, VA	911,217	2,078,793	2,001,495	1,167,576	1,090,278	128%	120%
Williamsport, PA	853,990	2,545,269	2,551,217	1,691,279	1,697,227	198%	199%
Wilson, NC	-	864,731	872,659	864,731	872,659		
Winchester, VA	974,250	1,286,611	1,163,577	312,361	189,327	32%	19%
Woodland, CA	1,303,449	2,052,983	1,552,273	749,534	248,824	58%	19%
Yakima, WA	2,032,796	2,382,514	2,114,629	349,718	81,833	17%	4%
Yuba City, CA	2,170,111	2,762,012	2,572,352	591,901	402,241	27%	19%
Yuma, AZ–CA	2,165,077	2,979,528	2,700,259	814,451	535,182	38%	25%
Zephyrhills, FL	883,931	1,221,736	1,122,781	337,805	238,850	38%	27%
TOTAL – SMALL URBAN	**401,726,141**	**608,072,325**	**550,150,188**	**206,346,184**	**148,424,047**	**51%**	**37%**

APPENDIX D: SUPPORTING TABLES FOR PREDICTED CHANGES IN § 5311 AND § 5307 FUNDING ALLOCATIONS BY COUNTY IN GEORGIA

This appendix contains supporting tables for the following future scenarios:

- Scenario 1A corresponds to the 50% probability model using a ½ mile distance threshold
- Scenario 2B corresponds to the 75% probability model using a 0 mile distance threshold

Tables D1–D5 report predicted changes in § 5311 and § 5307 funding for counties in Georgia. Unlike the analysis in Appendix C, the § 5311 and § 5307 totals reported here do include the growing states portion (of § 5340 piece). The tables organize the counties according to the following classifications:

- Counties that Currently Do Not Have Transit Service
- Counties that Currently Operate Countywide 5311 Service and No 5307 Service
- Counties that Currently Operate Citywide 5311 Service and No 5307 Service
- Counties that Currently Operate Both 5311 and 5307 Service
- Counties that Currently Operate Only 5307 Service

Similar to Tables C2–C5, Tables D1–D5 show the changes in § 5311 and § 5307 funding that each county in Georgia would experience if the FTA data values from FY18 were applied to the new population, population density, and other inputs used in the allocation formula after the 2020 census. The key difference is that the numbers reported in Appendix D include the § 5340 growing states portion for both the § 5311 and § 5307 amounts.

TABLE D1

Comparison of Current (FY19) and Future § 5311 and § 5307 Funding for Counties in Georgia (Assumes Same FTA Data Values and Includes Growing States): Counties that Currently Do Not Have Transit Service

	§ 5311 Appropriation	§ 5307 Appropriation	§ 5311 Forecast		§ 5307 Forecast		§ 5311 Difference Forecast–FY19		§ 5307 Difference Forecast–FY19	
County	FY19	FY19	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi
Appling	139,727	-	141,462	143,192	-	-	1,735	3,465		
Atkinson	70,248	-	78,140	79,095	-	-	7,892	8,847		
Barrow	356,850	64,187	102,638	62,673	305,713	325,985	-254,212	-294,177	241,526	261,798
Candler	82,389	-	83,695	84,719	-	-	1,306	2,330		
Charlton	110,912	-	118,680	120,132	-	-	7,768	9,220		
Chattahoochee	30,882	106,684	33,195	33,547	112,384	111,723	2,313	2,665	5,700	5,039
Clinch	81,943	-	82,813	83,826	-	-	870	1,883		
Coffee	290,198	-	305,999	309,741	-	-	15,801	19,543		
Echols	44,480	-	46,431	46,999	-	-	1,951	2,519		
Emanuel	175,702	-	180,103	182,305	-	-	4,401	6,603		
Evans	77,378	-	81,161	82,153	-	-	3,783	4,775		
Fayette	116,242	466,882	96,611	53,439	492,792	500,578	-19,631	-62,803	25,910	33,696
Franklin	150,781	-	151,556	153,409	-	-	775	2,628		
Harris	205,599	743	224,836	225,093	502	2,879	19,237	19,494	-241	2,136
Houston	98,435	2,250,481	87,112	71,540	2,547,348	2,300,627	-11,323	-26,895	296,867	50,146
Irwin	76,767	-	75,794	76,720	-	-	-973	-47		
Jasper	104,453	-	103,696	103,472	906	2,075	-757	-981	906	2,075
Jeff Davis	110,267	-	112,854	114,234	-	-	2,587	3,967		
Johnson	75,337	-	75,034	75,951	-	-	-303	614		
Lanier	72,093	-	76,886	76,808	-	3,359	4,793	4,715		3,359
Laurens	343,592	-	351,720	356,021	-	-	8,128	12,429		
Madison	173,755	25,064	177,972	179,683	-	36,036	4,217	5,928	-	36,036
Marion	71,335	-	74,590	75,502	-	-	3,255	4,167		
Monroe	173,863	4,309	180,446	171,880	7,356	20,906	6,583	-1,983	3,047	16,597
Montgomery	66,243	-	70,358	71,218	-	-	4,115	4,975		

TABLE D1

Comparison of Current (FY19) and Future § 5311 and § 5307 Funding for Counties in Georgia (Assumes Same FTA Data Values and Includes Growing States): Counties that Currently Do Not Have Transit Service (Continued)

	§ 5311 Appropriation	§ 5307 Appropriation	§ 5311 Forecast		§ 5307 Forecast		§ 5311 Difference (Forecast – FY19)		§ 5307 Difference (Forecast – FY19)	
County	**FY19**	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Newton	199,352	395,258	182,894	148,808	445,782	445,711	-16,458	-50,544	50,524	50,453
Oconee	102,671	160,141	94,694	72,770	205,074	219,724	-7,977	-29,901	44,933	59,583
Oglethorpe	110,363	1,026	113,968	114,891	1,034	1,796	3,605	4,528	8	770
Rockdale	81,003	456,127	63,759	37,823	482,190	479,565	-17,244	-43,180	26,063	23,438
Schley	39,148	-	42,003	42,517	-	-	2,855	3,369		
Stephens	169,326	-	170,702	172,790	-	-	1,376	3,464		
Tattnall	178,355	-	188,052	190,352	-	-	9,697	11,997		
Toombs	190,041	-	195,572	197,964	-	-	5,531	7,923		
Treutlen	51,556	-	51,060	51,685	-	-	-496	129		
Washington	162,573	-	161,493	163,468	-	-	-1,080	895		
Webster	26,762	-	28,543	28,892	-	-	1,781	2,130		
White	175,914	-	184,811	187,071	-	-	8,897	11,157		
TOTAL	4,786,535	3,930,902	4,591,333	4,442,383	4,601,081	4,450,964	-195,202	-344,152	695,243	545,126

TABLE D2

Comparison of Current (FY19) and Future § 5311 and § 5307 Funding for Counties in Georgia (Assumes Same FTA Data Values and Includes Growing States): Counties that Currently Operate Countywide § 5311 Service and No § 5307 Service

	§ 5311 Appropriation	§ 5307 Appropriation	§ 5311 Forecast		§ 5307 Forecast		§ 5311 Difference (Forecast – FY19)		§ 5307 Difference (Forecast – FY19)	
County	FY19	FY19	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi
Bacon	85,353	-	86,968	88,031	-	-	1,615	2,678		
Baker	39,788	-	39,821	40,308	-	-	33	520		
Baldwin	303,816	-	306,337	310,083	-	-	2,521	6,267		
Banks	127,715	-	131,272	132,877	-	-	3,557	5,162		
Ben Hill	141,737	-	142,225	143,964	-	-	488	2,227		
Berrien	149,233	-	152,702	154,569	-	-	3,469	5,336		
Bleckley	92,934	-	92,834	93,969	-	-	-100	1,035		
Brantley	139,785	-	145,157	146,932	-	-	5,372	7,147		
Brooks	129,146	9,933	123,938	124,839	12,560	13,762	-5,208	-4,307	2,627	3,829
Bryan	153,844	53,704	184,309	134,336	104,027	153,850	30,465	-19,508	50,323	100,146
Bulloch	502,429	-	514,839	521,135	-	-	12,410	18,706		
Burke	196,499	-	201,100	203,559	-	-	4,601	7,060		
Butts	157,906	-	155,169	152,634	1,291	4,148	-2,737	-5,272	1,291	4,148
Camden	351,066	-	371,619	376,163	-	-	20,553	25,097		
Carroll	586,929	123,215	592,153	241,717	160,175	153,218	5,224	-345,212	36,960	30,003
Catoosa	121,553	269,716	114,839	113,176	346,800	334,730	-6,714	-8,377	77,084	65,014
Chattooga	180,648	-	177,718	179,891	-	-	-2,930	-757		
Clay	43,425	-	42,899	43,424	-	-	-526	-1		
Colquitt	355,339	-	371,475	376,017	-	-	16,136	20,678		
Columbia	160,529	615,924	150,506	143,481	1,052,167	1,027,775	-10,023	-17,048	436,243	411,851
Cook	137,809	-	148,469	150,284	-	-	10,660	12,475		
Coweta	294,015	485,128	276,641	183,605	624,565	667,081	-17,374	-110,410	139,437	181,953
Crawford	97,000	-	95,998	97,172	-	-	-1,002	172		
Crisp	178,092	-	176,196	178,350	-	-	-1,896	258		
Dade	103,421	9,527	105,144	101,163	10,444	12,405	1,723	-2,258	917	2,878

TABLE D2

Comparison of Current (FY19) and Future § 5311 and § 5307 Funding for Counties in Georgia (Assumes Same FTA Data Values and Includes Growing States): Counties that Currently Operate Countywide § 5311 Service and No § 5307 Service (Continued)

	§ 5311 Appropriation	§ 5307 Appropriation	§ 5311 Forecast		§ 5307 Forecast		§ 5311 Difference (Forecast – FY19)		§ 5307 Difference (Forecast – FY19)	
County	FY19	FY19	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi
Dawson	120,195	22,585	91,720	65,326	49,032	91,103	-28,475	-54,869	26,447	68,518
Decatur	225,414	-	222,943	225,669	-	-	-2,471	255		
Dodge	162,359	-	161,786	163,764	-	-	-573	1,405		
Dooly	132,151	-	129,552	131,137	-	-	-2,599	-1,014		
Early	103,306	-	100,496	101,725	-	-	-2,810	-1,581		
Effingham	342,856	6,524	374,753	241,808	21,309	191,892	31,897	-101,048	14,785	185,368
Elbert	150,338	-	147,517	149,321	-	-	-2,821	-1,017		
Fannin	169,038	-	193,238	195,601	-	-	24,200	26,563		
Forsyth	115,481	922,057	65,249	22,120	1,321,238	1,373,610	-50,232	-93,361	399,181	451,553
Gilmer	201,061	-	214,464	217,087	-	-	13,403	16,026		
Glascock	27,871	-	28,596	28,946	-	-	725	1,075		
Glynn	204,146	667,852	192,009	160,653	720,823	660,734	-12,137	-43,493	52,971	-7,118
Gordon	362,415	-	376,325	380,927	-	-	13,910	18,512		
Grady	199,776	-	203,446	205,934	-	-	3,670	6,158		
Greene	132,953	-	141,982	143,718	-	-	9,029	10,765		
Habersham	278,571	-	297,668	301,308	-	-	19,097	22,737		
Hancock	86,752	-	86,370	87,426	-	-	-382	674		
Haralson	195,205	-	194,004	139,926	1,422	56,111	-1,201	-55,279	1,422	56,111
Hart	171,447	-	173,395	175,515	-	-	1,948	4,068		
Heard	89,321	-	87,013	87,970	-	97	-2,308	-1,351		97
Jackson	341,984	41,301	336,684	221,705	93,661	200,775	-5,300	-120,279	52,360	159,474
Jefferson	142,343	-	142,563	144,306	-	-	220	1,963		
Jenkins	72,432	-	78,347	79,305	-	-	5,915	6,873		
Jones	165,680	53,219	167,998	163,988	48,094	58,138	2,318	-1,692	-5,125	4,919
Lamar	123,633	-	122,400	123,896	129	126	-1,233	263	129	126

TABLE D2

Comparison of Current (FY19) and Future § 5311 and § 5307 Funding for Counties in Georgia (Assumes Same FTA Data Values and Includes Growing States): Counties that Currently Operate Countywide § 5311 Service and No § 5307 Service (Continued)

	§ 5311 Appropriation	§ 5307 Appropriation	§ 5311 Forecast		§ 5307 Forecast		§ 5311 Difference (Forecast – FY19)		§ 5307 Difference (Forecast – FY19)	
County	FY19	FY19	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi	75% 0 mi	50% ½ mi
Lee	109,217	167,091	110,216	80,106	192,431	223,772	999	-29,111	25,340	56,681
Lincoln	62,560	-	62,897	63,666	-	-	337	1,106		
Long	97,555	33,585	135,136	134,301	61,112	63,895	37,581	36,746	27,527	30,310
Lowndes	247,428	1,076,358	237,524	228,695	1,196,358	1,125,250	-9,904	-18,733	120,000	48,892
Lumpkin	201,185	-	210,523	212,607	-	573	9,338	11,422		573
McIntosh	110,952	-	112,492	113,867	35,857	-	1,540	2,915		
Macon	117,894	-	113,137	114,521	-	-	-4,757	-3,373		
Madison	173,755	25,064	177,972	179,683	-	36,036	4,217	5,928		10,972
Meriwether	163,503	-	161,675	163,485	-	126	-1,828	-18		126
Miller	56,244	-	55,370	56,047	-	-	-874	-197		
Mitchell	189,939	-	186,698	188,981	-	-	-3,241	-958		
Morgan	130,783	-	132,538	134,159	-	-	1,755	3,376		
Murray	196,489	133,565	185,842	168,111	163,020	194,345	-10,647	-28,378	29,455	60,780
Paulding	206,703	649,216	156,953	118,370	814,427	809,109	-49,750	-88,333	165,211	159,893
Peach	139,557	66,984	129,030	116,957	80,934	91,379	-10,527	-22,600	13,950	24,395
Pickens	188,909	-	198,920	201,353	-	-	10,011	12,444		
Pierce	142,209	-	146,942	148,739	-	-	4,733	6,530		
Pike	116,990	954	113,844	102,461	4,824	13,168	-3,146	-14,529	3,870	12,214
Pulaski	85,829	-	85,200	86,242	-	-	-629	413		
Putnam	151,234	-	153,537	155,415	-	-	2,303	4,181		
Quitman	30,616	-	29,191	29,548	-	-	-1,425	-1,068		
Rabun	123,047	-	127,357	128,914	-	-	4,310	5,867		
Randolph	94,469	-	93,368	94,510	-	-	-1,101	41		
Screven	127,231	-	125,686	127,223	-	-	-1,545	-8		

TABLE D2

Comparison of Current (FY19) and Future § 5311 and § 5307 Funding for Counties in Georgia (Assumes Same FTA Data Values and Includes Growing States): Counties that Currently Operate Countywide § 5311 Service and No § 5307 Service (Continued)

	§ 5311 Appropriation	§ 5307 Appropriation	§ 5311 Forecast		§ 5307 Forecast		§ 5311 Difference (Forecast – FY19)		§ 5307 Difference (Forecast – FY19)	
County	**FY19**	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Seminole	72,738	-	74,453	75,364	-	-	1,715	2,626		
Spalding	178,815	231,447	172,344	140,893	247,702	265,604	-6,471	-37,922	16,255	34,157
Stewart	78,594	-	77,534	78,482	-	-	-1,060	-112		
Talbot	72,558	-	71,596	72,471	-	-	-962	-87		
Taliaferro	22,137	-	22,433	22,708	-	-	296	571		
Taylor	83,154	-	82,385	83,392	-	-	-769	238		
Telfair	125,394	-	127,013	128,566	-	-	1,619	3,172		
Thomas	333,441	-	347,403	351,651	-	-	13,962	18,210		
Tift	268,249	-	269,824	273,123	-	-	1,575	4,874		
Towns	73,881	-	82,607	83,617	-	-	8,726	9,736		
Troup	442,159	-	467,006	472,717	-	-	24,847	30,558		
Turner	74,070	-	71,212	72,083	-	-	-2,858	-1,987		
Twiggs	76,992	-	72,244	72,988	-	154	-4,748	-4,004		154
Union	145,535	-	158,815	160,757	-	-	13,280	15,222		
Upson	188,702	-	187,808	190,105	-	-	-894	1,403		
Walker	274,768	183,474	256,458	257,611	300,589	301,984	-18,310	-17,157	117,115	118,510
Ware	273,977	-	268,808	272,095	-	-	-5,169	-1,882		
Warren	52,712	-	50,489	51,106	-	-	-2,223	-1,606		
Wayne	237,040	-	239,893	243,328	-	-	2,853	6,288		
Wheeler	62,975	-	67,755	68,583	-	-	4,780	5,608		
Whitfield	211,382	952,223	177,180	156,211	1,029,458	1,013,004	-34,202	-55,171	77,235	60,781
Wilcox	86,544	-	86,399	87,455	-	-	-145	911		
Wilkes	94,561	-	93,791	94,938	-	-	-770	377		
Wilkinson	84,129	-	84,030	85,057	-	-	-99	928		
TOTAL	16,025,544	6,800,646	16,082,374	15,134,022	8,694,449	9,137,954	56,830	-891,522	1,883,010	2,337,308

TABLE D3

Comparison of Current (FY19) and Future § 5311 and § 5307 Funding for Counties in Georgia (Assumes Same FTA Data Values and Includes Growing States): Counties that Currently Operate Citywide § 5311 Service and No § 5307 Service

	§ 5311 Appropriation	§ 5307 Appropriation	§ 5311 Forecast		§ 5307 Forecast		§ 5311 Difference (Forecast – FY19)		§ 5307 Difference (Forecast – FY19)	
County	**FY19**	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Calhoun	60,196	-	60,062	60,797		-	-134	601		
Polk	272,322	-	278,108	281,509		-	5,786	9,187		
Sumter	235,049	-	226,890	229,665		-	-8,159	-5,384		
Terrell	82,850	-	80,453	81,436		-	-2,397	-1,414		
Walton	350,405	153,032	332,242	187,394	195,497	302,973	-18,163	-163,011	42,465	149,941
Worth	178,361	-	175,944	178,096		-	-2,417	-265		
TOTAL	1,179,183	153,032	1,153,699	1,018,897	195,497	302,973	-25,484	-160,286	42,465	149,941

TABLE D4

Comparison of Current (FY19) and Future § 5311 and § 5307 Funding for Counties in Georgia (Assumes Same FTA Data Values and Includes Growing States): Counties that Currently Operate Both § 5311 and § 5307 Service

	§ 5311 Appropriation	§ 5307 Appropriation	§ 5311 Forecast		§ 5307 Forecast		§ 5311 Difference (Forecast – FY19)		§ 5307 Difference (Forecast – FY19)	
County	**FY19**	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Bartow	277,333	1,220,368	243,254	191,218	1,268,757	1,301,721	-34,079	-86,115	48,389	81,353
Chatham	110,493	3,646,778	91,053	62,680	3,751,271	3,658,738	-19,440	-47,813	104,493	11,960
Cherokee	259,193	1,185,905	207,921	131,575	1,407,028	1,410,516	-51,272	-127,618	221,123	224,611
Dougherty	107,834	1,172,357	96,409	91,353	1,127,522	1,108,121	-11,425	-16,481	-44,835	-64,236
Hall	259,256	2,194,364	244,407	231,928	2,417,680	2,357,220	-14,849	-27,328	223,316	162,856
Henry	198,129	1,231,829	98,885	39,332	1,455,091	1,488,995	-99,244	-158,797	223,262	257,166
Liberty	116,931	723,315	120,785	118,257	771,419	740,703	3,854	1,326	48,104	17,388
Richmond	140,988	1,702,365	123,295	110,685	1,703,093	1,649,351	-17,693	-30,303	728	-53,014
TOTAL	1,470,157	13,077,281	1,226,009	977,028	13,901,861	13,715,363	-244,148	-493,129	824,580	638,084

TABLE D5

Comparison of Current (FY19) and Future § 5311 and § 5307 Funding for Counties in Georgia (Assumes Same FTA Data Values and Includes Growing States): Counties that Currently Operate Only § 5307 Service

	§ 5311 Appropriation	§ 5307 Appropriation	§ 5311 Forecast		§ 5307 Forecast		§ 5311 Difference (Forecast – FY19)		§ 5307 Difference (Forecast – FY19)	
County	**FY19**	**FY19**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**	**75% 0 mi**	**50% ½ mi**
Bibb	147,791	2,412,707	117,092	80,610	2,431,907	2,265,132	-30,699	-67,181	19,200	-147,575
Clarke	46,333	2,391,818	38,655	33,160	2,631,717	2,530,319	-7,678	-13,173	239,899	138,501
Clayton	15,329	7,268,028	10,386	2,182	7,311,963	7,251,276	-4,943	-13,147	43,935	-16,752
Cobb	10,283	6,500,720	218	-	6,964,350	6,826,786	-10,065		463,630	326,066
DeKalb	11,712	19,785,158	4,036	361	20,012,098	19,793,833	-7,676	-11,351	226,940	8,675
Douglas	131,355	1,134,652	104,526	74,528	1,208,721	1,181,012	-26,829	-56,827	74,069	46,360
Floyd	238,009	1,861,312	233,387	216,505	1,883,167	1,874,303	-4,622	-21,504	21,855	12,991
Fulton	64,949	25,680,194	39,349	16,275	26,396,943	26,089,202	-25,600	-48,674	716,749	409,008
Gwinnett	24,449	6,621,237	11,379	5,864	7,522,623	7,328,509	-13,070	-18,585	901,386	707,272
Muscogee	40,891	3,541,921	37,757	29,741	3,733,106	3,703,723	-3,134	-11,150	191,185	161,802
TOTAL	731,101	77,197,747	596,785	459,226	80,096,595	78,844,095	-134,316	-261,592	2,898,848	1,646,348
GRAND TOTAL	24,174,995	101,134,544	23,629,142	22,010,706	107,489,483	106,415,315	-545,853	-2,154,006	6,344,146	5,280,771