RESEARCH REPORT

Transit(ory) Finance: The Past, Present, and Future Fiscal Effects of COVID-19 on Public Transit in Southern California

February 2022

UCLA Institute of Transportation Studies

Abstract

This study reports on the recent past, present, and immediate future public transit finance in Southern California in light of the impacts of the ongoing COVID-19 pandemic. To do this, we draw on transit agency budgets, interviews, preliminary survey results, and other datasets and reports. Initially, the financial situation of transit operators in the region appeared dire, with plummeting ridership and fares and rising subsidies and operating costs. However, the three enormous federal pandemic relief bills brought $4.4 billion to Southern California transit agencies and helped the region weather the fiscal storm, until many of the state and local tax revenue sources on which the region's transit agencies rely bounced back—and more quickly than most forecasters initially predicted. This is, in other words, the story of successful public policy intervention to the benefit of both the region's transit riders and workers, though most operators nonetheless cut service and their workforces to varying degrees during the pandemic. The principal dilemma facing the region's transit operators in 2022 is not a depressed economy, but an overheated one plagued by labor shortages, supply-chain bottlenecks, and inflation—as agencies plan for the end of large-scale federal operating support and an uncertain ridership future.

About the UCLA Institute of Transportation Studies

The UCLA Institute of Transportation Studies supports and advances cutting-edge research, the highest-quality education, and meaningful and influential civic engagement on the many pressing transportation issues facing our cities, state, nation and world today. The institute is part of the University of California Institute of Transportation Studies, a four-campus consortium that includes UC Berkeley, UC Davis and UC Irvine. UCLA ITS is also a proud partner of the Pacific Southwest Region 9 University of Transportation Center, a federally funded research network with seven other universities.

Acknowledgements

This study was made possible with funding from the John Randolph Haynes and Dora Haynes Foundation. The authors would like to thank Mark Garrett for his thorough review, Bill Burke and Denia Camacho at the Haynes Foundation for the support, Natalie Amberg for the help with local option sales tax data, and all of the transit operator staff who took the time to discuss and answer questions on these issues.

The Institute of Transportation Studies at UCLA acknowledges the Gabrielino/Tongva peoples as the traditional land caretakers of Tovaangar (the Los Angeles basin and So. Channel Islands). As a land grant institution, we pay our respects to the Honuukvetam (Ancestors), ‘Ahiihirom (Elders) and ‘Eyoohiinkem (our relatives/relations) past, present and emerging.

Disclaimer

Transit(ory) Finance: The Past, Present, and Future Fiscal Effects of COVID-19 on Public Transit in Southern California

Jacob L. Wasserman, https://orcid.org/0000-0003-2212-5798
Nataly Rios, https://orcid.org/0000-0002-3413-9524
Hannah King, https://orcid.org/0000-0003-4500-3208
Fariba Siddiq, https://orcid.org/0000-0002-0361-6594
Benjamin Bressette, https://orcid.org/0000-0001-6800-9683
Brian D. Taylor, PhD, FAICP, https://orcid.org/0000-0002-1037-2751

February 2022
Project ID: UCLA ITS-LA2109a
DOI: 10.17610/T60G65
Photo Credit: McGill Productions/Unsplash

UCLA Institute of Transportation Studies

TABLE OF CONTENTS

Table of Contents

List of Tables

List of Figures

EXECUTIVE SUMMARY

Executive Summary

The global COVID-19 pandemic severely affected public transit systems worldwide. In the U.S., public transit lost from 50 to better than 90 percent of their riders early on, due to stay-at-home orders, shuttered businesses, or simply public fear of traveling with others. The consequent collapse in fare revenues coupled with the economic slowdown that initially reduced tax revenues available to subsidize transit services left agencies struggling to maintain operations. Many operators cut service, sometimes resulting in uncomfortable crowding for those still riding transit, most of whom had few other choices on how to get around. Meanwhile, projections developed in the early months of the pandemic predicted dramatic declines and a protracted recovery of key revenue sources for transportation in California. Even two years into the pandemic, the recovery of transit ridership remains slow and uneven (FTA, 2021b; Agrawal et al., 2020; Dadayan, 2020; and LA Metro, 2020c).

And yet, this is in many ways a positive story about a dark time. To avert the financial collapse of public transit systems nationwide, including in Southern California, Congress passed and two Presidents signed not just one but three major financial relief packages that literally rescued public transit in Southern California (and the rest of the U.S. as well) (FTA, 2021c, 2021g and USDOT, 2021). To a large extent, the principal takeaway from this report is the extent to which this dramatic financial rescue kept Southern California public transit afloat during the pandemic-induced fiscal crisis. At the same time, while slow-to-return riders promise to keep fare revenues down for at least the medium term, the global and California economies bounced back quickly after the initial pandemic-induced collapse, which has caused most local, regional, and state subsidy sources that finance transit in Southern California to bounce back as well. In fact, the principal dilemma facing the region's transit operators in 2022 is not a depressed economy, but an overheated one plagued by labor shortages, supply-chain bottlenecks, and inflation.

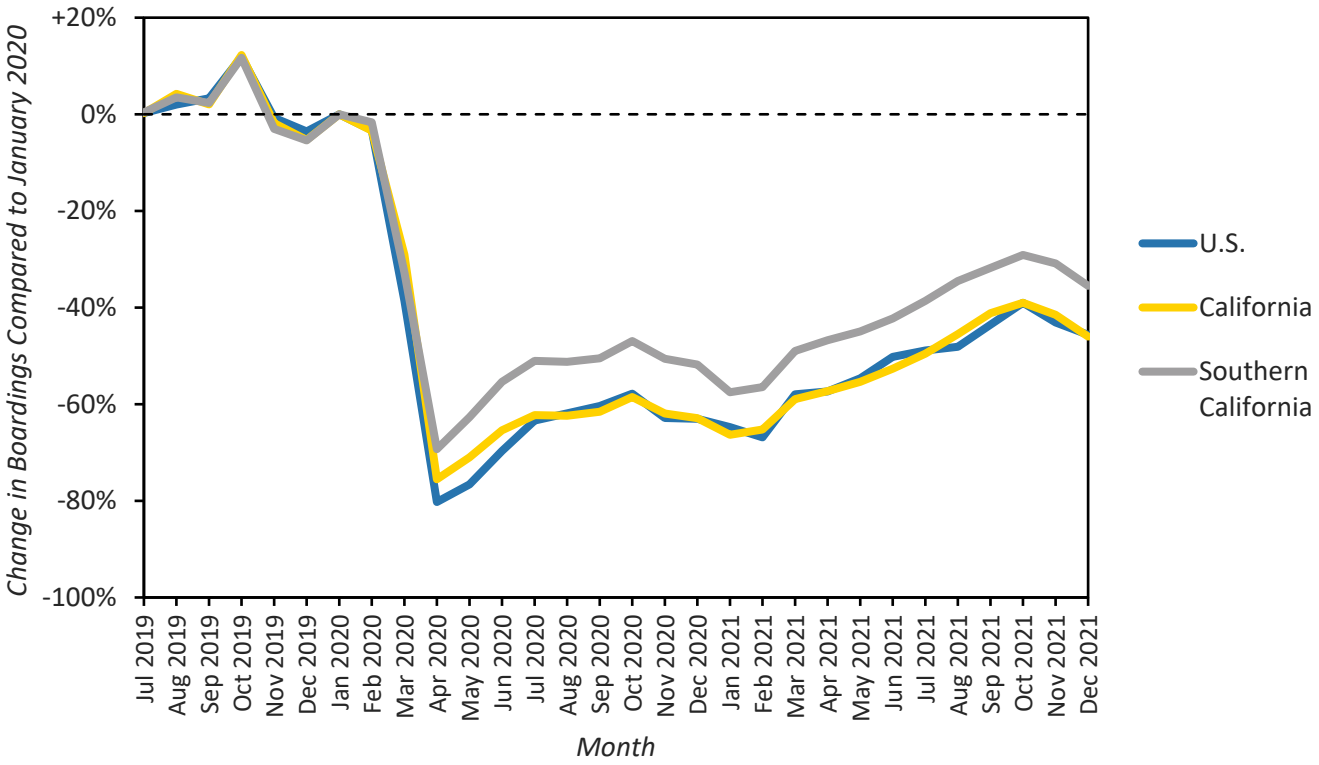
This study reports on the recent past, present, and immediate future public transit finance in Southern California in light of the impacts of the ongoing COVID-19 pandemic. We examine why and how the pandemic has affected transit ridership and transit agency finances in Southern California and how local transit providers and federal, state, and local governments responded to the financial crisis that hit transit. We also discuss how local providers took advantage of federal support and unexpectedly resilient local revenues, despite numerous challengers including added COVID-related expenses and workforce challenges. Looking forward, we explore consequences and challenges that transit faces during the pandemic recovery period. To assess direct and indirect financial consequences of and responses to the pandemic, we draw on transit operator budgets, interviews with transit agency staff, national datasets of transit finance and use, and the preliminary results of a survey of transit operators on financial implications of the pandemic, as well as prior academic studies, industry reports, news articles, and other materials.

Effects of the Pandemic on Transit Finance in Southern California

In the spring of 2020, ridership across Southern California cratered as monthly boardings dropped 69 percent, a loss of over 31 million monthly trips (See **Figure ES-1**). However, this decline was less severe than the country and state overall (FTA, 2021b), as transit riders in Southern California are disproportionately essential workers, particularly low-income riders and riders of color, who were more likely to continue riding during the pandemic (Paul and Taylor, 2022; Liu, Miller, and Scheff, 2020; TransitCenter, 2020a; and A. Walker, 2022). Nonetheless,

the ridership drop—and temporary suspensions of fare collection or enforcement on most systems—led to steep losses in fare revenues on every operator that we surveyed and examined. This increased the subsidies to serve the riders that remained. Across the region, the subsidy per rider increased 27 percent between Fiscal Year (FY) 2019 (July 1, 2018 to June 30, 2019) and FY 2020 (July 1, 2019 to June 30, 2020). Irrespective of patronage changes, transit agencies also faced rising costs to supply that service. Each revenue service hour was about $12 more expensive (+8%) in FY 2020 than in FY 2019. given the costs of worker overtime, COVID-19 health and safety protocols, and fixed overhead (FTA, 2021b). Note that FY 2020 captured only four months of pandemic service; the costs and subsidies during these initial pandemic months alone, could they be consistently isolated, were likely much higher.

Figure ES-1. Changes in Monthly Transit Boardings during the Pandemic



Note: Data do not include very small and rural operators that do not report monthly to the NTD.

Data source: FTA, 2021b

Facing these losses atop the chaotic operational challenges of running an essential service during a public health emergency, Southern California transit agencies received a major fiscal boost from two sources: unprecedented operational support from the three federal stimulus bills and rapidly revived revenues from local option sales taxes (LOSTs) for transportation.

During the pandemic, the federal government provided a new revenue source for transit operations at a scale never seen before. The three stimulus bills—the CARES Act in March 2020, the CRRSA Act in December 2020,

and the ARP Act in March 2021[1]—collectively provided Southern California transit operators $4.39 billion. Unlike most prior federal support for urban transit, these funds could be spent on operations, not just capital projects; waived usual state/local funding match requirements; and came with few restrictions on eligible expenses. Across the three stimulus bills, Southern California transit operators got 1.3 times more than an ordinary year's worth of operating funds on top of the fares, state support, sales taxes, federal capital dollars, and other revenues they collected. This stimulus funding plugged short-term losses in tax revenues and more persistent shortfalls on fare revenues due to depressed ridership (FTA, 2021a, 2021b, 2021c, 2021d, 2021f, 2021g; LA Metro staffer, 2021; OCTA staffer, 2021; RCTC staffer, 2021; SBCTA staffer, 2021; and VCTC staffer, 2021). Given the higher costs and extraordinary circumstances of providing service during a public health emergency, one could hardly call the situation a boon. Nevertheless, the federal government stepped in at the right time to shore up the region's precarious transit finances. Indeed, without stimulus funds, interviewees related that their agencies would have had to have made drastic cuts to the detriment of their service, their employees, and ultimately their riders, as they avoided a financial death spiral of lower service levels, depressed ridership, and lost revenue. Without stimulus funds, they also would have had difficulties in restoring service and their workforce during the pandemic recovery.

Table ES-1. Allocated Federal COVID-19 Stimulus Funding by County

County	Total Transit Stimulus Funding	2020 Population	Transit Stimulus Funds per Person	Report Year 2018 Operating Costs	Percent of Pre-pandemic Operating Costs Covered by Stimulus Funding	Transit Operators Receiving Stimulus Funding
Los Angeles	$3,166 mil.	10.0 mil.	$315	$2,491 mil.	127%	59
Orange	$394 mil.	3.2 mil.	$124	$291 mil.	136%	3
Riverside	$177 mil.	2.4 mil.	$72	$116 mil.	153%	6
San Bernardino	$186 mil.	2.2 mil.	$85	$119 mil.	156%	6
Ventura	$85 mil.	0.8 mil.	$100	$51 mil.	166%	8
Multi-county operators, small paratransit operators, and special projects	$380 mil.	N/A	N/A	N/A	N/A	19
Total	**$4,389 mil.**	**18.6 mil.**	**$214**	**N/A**	**N/A**	**101**

Note: Figures may not reflect stimulus funds not allocated to operators at time of writing.

Data sources: LA Metro staffer, 2021; OCTA staffer, 2021; RCTC staffer, 2021; SBCTA staffer, 2021; VCTC staffer, 2021; FTA, 2021b; and U.S. Census Bureau, 2020

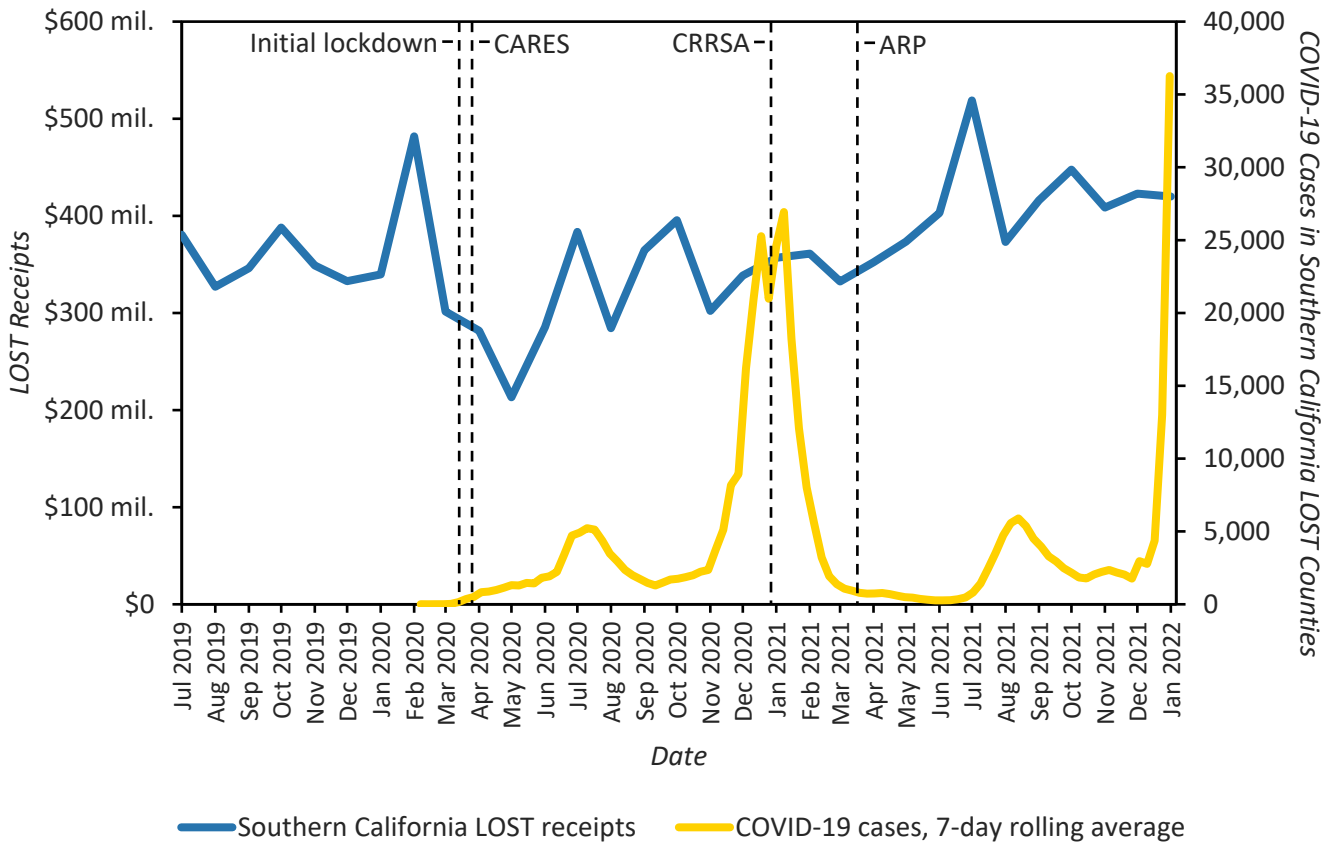
[1]. The Coronavirus Aid, Relief, and Economic Security Act, Coronavirus Response and Relief Supplemental Appropriation Act, and American Rescue Plan Act, respectively

As with any large funding program, though, the devil is in the details. Because of the design of the federal allocation formulas and their interpretation—and political negotiations—by the region's metropolitan planning organization and county transportation commissions, stimulus distributions varied across transit operators and counties by a variety of metrics (See **Table ES-1**). Los Angeles County received the most total stimulus dollars and funds per person. But because it is home to far more transit agencies than other counties, each operator received, on average, a lower share of their pre-pandemic operating expenses covered by stimulus funds. Moreover, some counties divided stimulus funds among operators proportional to pre-pandemic operating costs, but the Los Angeles County Metropolitan Transportation Authority (LA Metro)—both the largest transit operator in Los Angeles County and the region and the entity responsible for allocating stimulus funds to other county operators—divided them instead according to projected agency losses in other revenues. This left many of the county's smaller operators, which were not eligible to receive funds from a number of pre-pandemic federal and state sources, in an awkward place: they received more in stimulus funds than they ordinarily would have from a federal funding package but less, relative to their pre-pandemic expenses, than peer agencies in other counties (FTA, 2021b; LA Metro staffer, 2021; OCTA staffer, 2021; RCTC staffer, 2021; SBCTA staffer, 2021; VCTC staffer, 2021; U.S. Census Bureau, 2020; SCAG Transportation Committee, 2021; PVTA, 2021; Sparks, 2022; and LA Metro, 2020c).

Even as the federal government threw transit agencies three substantial fiscal lifelines, it turned out that Southern California operators were doing better staying afloat with local tax subsidy support than most observers had anticipated. Specifically, dedicated sales tax revenues that support transportation in every Southern California county but Ventura remained healthy, after a deep, albeit brief drop at the start of the pandemic—38 percent below January 2020 levels in May 2020 but fully rebounded by July 2020 (See **Figure ES-2**). With the broader economy and spending patterns recovering from the pandemic shock relatively quickly, both in-person and online sales subject to taxes bounced back and transit agencies were again able to rely on this resilient revenue stream. Again, Los Angeles County stands out: its four transportation LOSTs combined account for over half of the state's LOST dollars, and they continued to provide the county hundreds of millions of dollars per month, near or above pre-pandemic levels, in the second half of 2020 and all of 2021 (CDTFA, 2022).

Though these and other funding sources helped Southern California transit systems weather the initial fiscal storm caused by the pandemic, many agencies budgeted conservatively and regional and county planning bodies disbursed funds conservatively throughout the pandemic. The transit agencies from which we obtained budgets spent substantially *less* in both capital and operating expenses in FY 2020 than they had initially budgeted, due to service cuts and fiscal prudence, but these agencies adopted budgets for FY 2021 with more operating spending than occurred in FY 2020 (FTA, 2021b). Meanwhile, funding agreements between agencies like Access Services (Los Angeles County's paratransit operator) and Metrolink (the region's commuter rail service) and the jurisdictions that fund them served as a budgetary backstop that provided crucial financial security for recipient operators and shifted, but did not eliminate, funding burdens.

Figure ES-2. LOST Receipts and COVID-19 Case Rates in Southern California LOST Counties



Data sources: CDTFA, 2022; California Health and Human Services, 2022; FTA, 2021c, 2021g; USDOT, 2021; and Cowan, 2021

Responses to the Pandemic and Their Financial Implications

Among the first responses to the pandemic by many transit systems was to cut service, though agencies reduced service more in response to falling demand, limited driver availability, and *anticipated* revenue losses than to actual shortfalls. Agencies first tried to maximize service while reducing the financial effects of operating it though making cuts to commuter routes that lost the most riders. After the passage of the three stimulus bills and the availability of vaccinations, systems began restoring service in advance of returning ridership. While two small systems we examined in detail did almost completely close for much of 2020, federal relief, increased funding flexibility, and nimble planning made even these most drastic service cuts only temporary.

Agencies scrambled to cover for the many vehicle operators who fell sick or took off to care for others, affecting both service and morale. Most transit agencies reported having sufficient funding throughout the pandemic to avoid major layoffs, though some implemented furloughs, salary freezes, or hiring freezes and offered early retirement options and buyouts for voluntary separations. These precautionary workforce measures appeared prudent to most observers at the time but in retrospect may have inadvertently exacerbated their labor challenges

in 2022 discussed below. On the other hand, some agencies paid vehicle operators even when pandemic disruptions eliminated their shifts; others had workers draw down their accrued paid leave.

Unlike transit operations and the transit workforce, transit capital projects remained relatively unaffected by the pandemic and pandemic-related budgetary changes. Many operators, especially larger agencies, either continued or expedited their capital projects during the pandemic. A few smaller systems delayed capital projects, though less because of funding shortfalls than funding uncertainty and a lack of institutional resources to manage it.

Looking Ahead

Even before the pandemic, a tight labor market in the public transit industry was hampering the smooth operation of service throughout the U.S. (Bliss, 2018). The COVID-19 pandemic exacerbated many of the downsides of front-line transit work and has led to deeper and occasionally crisis-level labor shortages in the industry. Southern California transit agencies report that they are losing vehicle operators and other front-line employees in droves and attracting fewer and fewer new hires to fill vacancies. Interviewees and reports identified both “push” factors—vehicle operators not wanting to get sick, enforce public health protocols, or conduct other stressful customer interactions on the job—and “pull” factors—hiring bonuses at trucking and delivery firms, competition for workers within the transit industry, and rising wages and inflation across all sectors of the economy (Rosenberg, 2021). While agencies are offering more incentives for new and existing workers, systems that directly employ their workforce and that each contract their service to private transit firms each, for different reasons, have been largely unable to nimbly raise wages and respond fully to the current labor market. Because of this, systems have generally not yet reported rising labor costs, but labor shortages have reduced transit service and slowed ridership recovery.

Meanwhile, agencies have largely discontinued one major pandemic-induced policy change: fare-free transit. Almost all Southern California transit systems suspended or reduced fare collections at the start of the pandemic, and almost all of them have restored fare collection as of this writing, according to our survey and interviews. Most agency staff and decision-makers with whom we spoke reported that they are not planning for, nor generally seriously considering, permanent, universal fareless transit. While fare-free transit lowers barriers to transit use, particularly among the lowest-income travelers, the most common reason given was making up for lost fare revenues, without another revenue source of the size of the federal pandemic stimulus bills on the horizon, as well as safety, homelessness, and capacity issues. In the wake of the pandemic, though, some agencies are expanding targeted programs that offer reduced or free fares to groups like students and low-income riders.

As agency staff consider these issues, they are also grappling with the end of large-scale federal operating support. The three stimulus bills represent a one-time (or, more accurately, a three-time) intervention, but according to FTA staff we interviewed, the federal government is likely returning to its previous role as primarily a capital funder, come what may during the pandemic recovery and beyond. The bipartisan infrastructure bill promises increased funding for transit capital improvements, including not just expansion but maintenance and modernization (FTA, 2022a), but does not squarely address current operational needs. Agencies must therefore plan for a future in which ridership continues to return sluggishly or incompletely and most federal operating support has ended. The federal stimulus funding, though, is still supporting transit in the region at this writing; we found a roughly even distribution between agencies on track to spend down their stimulus funds in the near term versus stretching them out at least another fiscal year. Interviewees expressed great uncertainty about how long ridership will take to return to pre-pandemic levels and what that means for agency budgets, though a few

agencies are conducting financial post-pandemic planning exercises. The character of transit ridership may also change: with the prospect of more telework and hybrid work, transit is likely, in at least the near term, to become even more of a social service for low-income and other transit-dependent riders than it was before the pandemic. Most Southern California transit agencies are adapting their service and financial strategies in response or planning to do so.

Conclusion

With respect to finance, the positive takeaway from this dark time is that a major federal public policy intervention *worked*; in Southern California it largely kept a regional public transit system composed of around 100 individual service providers financially afloat and able to serve many of the region's most disadvantaged travelers through an enormously challenging time.

While the region's public transit systems will face many challenges in the months and years ahead, imminent financial collapse is not one of them. That we could not have made such an assertion when we commenced this research in the fall of 2020 speaks to how much the pandemic, public transit, and public policy have evolved since then.

CONTENTS

Introduction

Transit's Financial Ills—and Fiscal Efforts to Cure Them

The economic effects of the global pandemic were dramatic and varied, in Southern California and around the world, and remain ongoing as of this writing. The initial shutdowns to stop the spread of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus, which causes Coronavirus Disease 2019 (COVID-19), essentially put the global economy into an induced coma in the spring of 2020. Economic activity, travel, and tax revenues all plummeted, with public transit systems—the public buses and trains that serve urban areas— and airlines hardest hit because they each gather strangers in close proximity while en route. Public transit systems in the U.S. lost from 50 to better than 90 percent of their riders early on (FTA, 2021b); these missing riders were stuck at home with nowhere to go and/or were fearful of traveling with others. Transit systems in Southern California were not exempt from these patronage losses. This collapse of ridership, in turn, meant a collapse in fare revenues, and an anesthetized economy meant falling tax revenues to subsidize transit services—putting pressure on transit systems to find alternative funds or reduce costs.

There are around 100 public transit systems in Southern California, and collectively they form a key element in the region's mobility network. The region's reputation as a uniquely car-centric region belies the fact that its residents drive less than the national average, and ride public transit more. Among the 80 U.S. urbanized areas with a population of a half-million or more, in only 16 of them do the residents drive less than in Los Angeles, while in 63 they drive more (FHWA, 2021). On the other hand, the Los Angeles urbanized area ranks third in the U.S. in total public transit trips, behind only New York and Chicago (Dickens, 2021).[2] Because transit use in Southern California is in fact substantial and because the region has invested heavily over the past third of a century in expanding and improving its transit services, the fiscal effects of the COVID-19 pandemic—on both transit systems and their riders—are enormously consequential for the region. It is against this backdrop that we examine the recent past, present, and near-term future of public transit finance in Southern California.

Just weeks into the pandemic, the TransitCenter, a foundation based in New York, estimated the annual financial shortfall across U.S. transit agencies would total between $26 and $40 billion, with losses not just in fares but in revenue from tolls, sales taxes, and transfers from local, state, and federal governments (TransitCenter, 2020b). The American Public Transportation Association (APTA) similarly predicted in a May 2020 report that transit agencies would experience, absent government rescue funding, $48.8 billion in revenue losses over the period from April 2020 through the end of 2021 (EBP U.S., 2020). Even as the economy improved by later in 2020, reports from Los Angeles to Maryland and New York City to Columbus warned of "transit in crisis" (Vock, 2020) and "existential peril" (Goldbaum and Wright, 2020), as agencies planned to make deep cuts to both service and jobs (Vock, 2020; Goldbaum and Wright, 2020; Berger, 2020; Goldbaum, 2020a; and Calvert, 2020).

---

[2]. There are many definitions of "Southern California" and "metropolitan Los Angeles" used in datasets, governance, and popular conceptions of the region. While here were refer to the Los Angeles-Long Beach-Anaheim urbanized area (the developed portions of Los Angeles and Orange Counties), we generally follow the Haynes Foundation's five-county definition of "Southern California" throughout the report, except where noted: Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties. On occasion, we also refer to the Southern California Association of Governments (SCAG) region, which adds Imperial County to this list.

To avert the financial collapse of public transit systems nationwide, including in Southern California, the federal government committed unprecedented public resources to support transit systems large and small. To a large extent, the principal takeaway from this report is the extent to which this dramatic financial rescue kept Southern California public transit afloat during the pandemic-induced fiscal crisis. The Coronavirus Aid, Relief, and Economic Security (CARES) Act, passed in March 2020, provided $25 billion for public transit systems (FTA, 2021c). This influx of funding prevented draconian cuts in service and personnel at most systems, but given the depth of early pandemic losses in fare revenue and other state and local funding and the increased costs associated with equipping vehicles and personnel for pandemic operations, many transit agencies quickly burned through their CARES Act funds. New York's transit system expected to be out of CARES act funding by the end of July 2020, and an analysis by the TransitCenter found that funding for the ten largest U.S. transit agencies would only last roughly three to six months (though smaller agencies, which received proportionally more funding, would be able to hold out for longer) (TransitCenter, 2020c).

While many state and local tax revenue sources for transit began to recover quickly over the second half of 2020, ridership and fare revenues remained low, while pandemic-related costs for vehicle cleaning and improved air filtration systems remained high (APTA Cleaning and Disinfecting Vehicles and Facilities Technical Advisory Group, 2020). It was at this point—with CARES Act funds dwindling and no certainty that additional federal bailout funding for public transit would be forthcoming—that we initially commenced this work on the financial condition and future of public transit in Southern California.

However, in late December 2020, Congress passed and then-President Trump signed the Coronavirus Response and Relief Supplemental Appropriations (CRRSA) Act, which earmarked another $14 billion for transit (FTA, 2021g). This bill, which again largely prevented severe service cuts and layoffs at transit agencies, was intended by its legislative authors as reprieve but not an ongoing rescue (Bliss, 2020). The two 2020 federal relief bills alone provided financial support to U.S. public transit systems equal to roughly half of all U.S. transit operating expenditures in 2018 (Mallett and Goldman, 2020).

Less than three months later, the new Biden administration pushed through the American Rescue Plan (ARP) Act, which included an additional $31 billion for transit (Wanek-Libman, 2021 and USDOT, 2021). So, in less than one year, the U.S. government provided public transit systems with nearly $70 billion in *additional* funding to cover pandemic-related revenue losses, with $4.4 billion of this funding coming to transit systems in Southern California. While this aid has certainly helped most transit agencies financially weather the pandemic-ravaged 2020 and 2021 years, the long-term financial stability of public transit in Southern California and around the nation is far from settled. Owing to a robust, if increasingly inflation-marred economic recovery, most state and local government subsidies of transit have fully recovered—although the number of transit riders and their fare revenues most decidedly have not.

So it is in this context—of near-term financial stability thanks to three generous federal bailout bills, but longer-term financial uncertainty—that we present this research on the present and future finance of public transit in Southern California. While this report primarily concerns transit finance, we discuss a range of operations, governance, and labor issues in transit that implicate finance and are intertwined with the ups and downs of transit revenues, subsidies, and spending.

In the next section, we provide context on how the pandemic has affected public transit and its riders in the nation as a whole, with particular attention to the financial ramifications of the pandemic for transit agencies. After, we look specifically at the pandemic's financial effects on transit systems in Southern California and their responses

to them. We follow that with a discussion of some important consequences and challenges that transit faces during the pandemic recovery period, including fare policy and medium-term financial planning discussions that directly concern transit budgets and workforce issues that indirectly implicate them.

First, though, we describe the workings of transit finance in the region and our methods for exploring them, below.

Structure of Transit Finance in California

Public transit systems in the U.S. rely on a variety of revenue sources to fund their operations, which typically vary substantially from system to system. A century ago, most public transit was owned and operated privately, while today the systems are almost exclusively public enterprises (Jones, 1985). Broadly, transit revenues are composed of income and subsidies. Income comes primarily from passenger fares but from advertising and charter service as well. Subsidies come from revenue sources unrelated to transit service (such as income and sales taxes). Transit subsidies, in turn, are typically divided between capital (for vehicles, stations, equipment, etc.) and operating (for operator and mechanic labor, fuel, etc.). Most transit income goes to fund operations, while capital expenditures are almost completely subsidized.

Transit systems in California and across the U.S. are subsidized primarily by local and regional governments and secondarily by the federal government and state governments. Nationwide, 45 percent of capital expenditures in 2019 were subsidized by local and regional governments, 32 percent by the federal government, and 23 percent by state governments. Prior to the pandemic, the federal role in subsidizing transit operations was much smaller, and confined mostly to small urban areas. Nationally, 35 percent of operating revenues come from local and regional governments, 23 percent from state governments, and just eight percent from the federal government, with the remaining 34 percent covered by fares and other directly generated revenue (See **Table 1**) (Dickens, 2021).

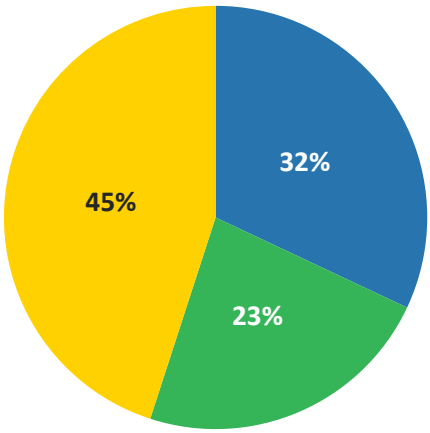
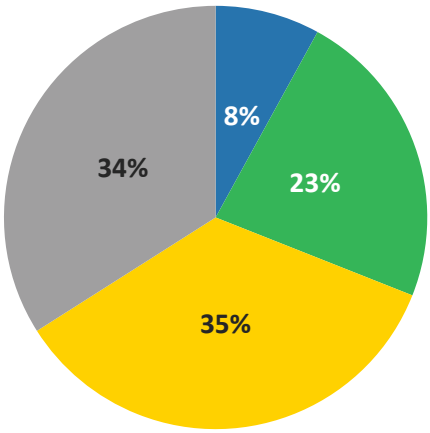
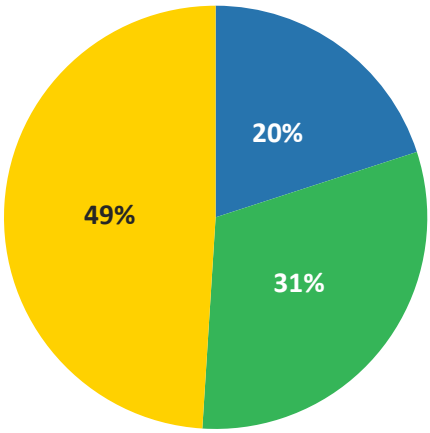
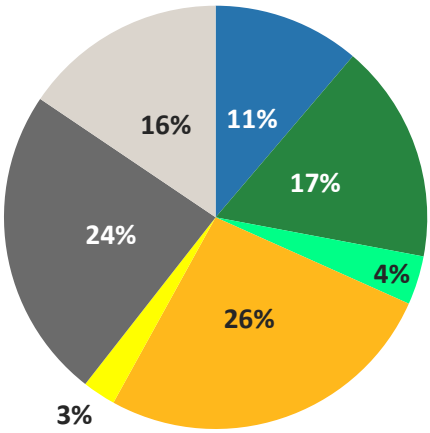
Considering both capital and operating revenues combined for California in 2015, about 40 percent of pre-pandemic transit revenues came from local and regional sources, 22 percent from federal sources, 18 percent from the state, and 17 percent from fares and other income. Transit capital subsidies in the Golden State came primarily from local and regional sources (49%), then state sources (31%), and then federal grants (20%). Transit operating revenues, by contrast, came mostly from local option sales taxes (LOSTs) earmarked for transportation (26%), fares (24%), the state Transportation Development Act (TDA) sales tax (17%), federal grants (outside of the large metropolitan areas) (11%), the State Transit Assistance (STA) program (4%), local property taxes (3%), and the remaining 16 percent from a variety of other sources, depending on the transit operator (See **Table 1**) (Matute et al., 2017).

In Southern California, the Southern California Association of Governments (SCAG) receives and distributes most federal transportation funds, including for public transit.[3] SCAG is the region's metropolitan planning organization (MPO), a federally mandated body responsible for long-range transportation planning and coordination, and is governed by a large board composed of local elected officials.

---

[3]. The U.S. Department of Transportation allocates various federal transit program funds to MPOs based on legislative formulas. We describe the federal formulas used to allocate federal transit funding across urbanized areas further in our discussion of the federal pandemic stimulus bills.

Table 1. Pre-pandemic Transit Capital and Operating Funding

Geography	Year	Capital Funding	Operating Funding
U.S.	2019		
California	FY 2015		

Data sources: Dickens, 2021 and Matute et al., 2017

In many cases, SCAG delegates distribution of key federal formula funds to the county transportation commissions (CTCs) in the region. In counties with local option sales taxes for transportation (all but Ventura in the region), CTCs are often also responsible for distributing those funds and prioritizing projects funded by them. Three of the region's CTCs are independent entities: the Riverside County Transportation Commission (RCTC), the San Bernardino County Transportation Authority (SBCTA), and the Ventura County Transportation Commission (VCTC). Two other agencies play dual roles as both CTCs (which distribute transit funds to operators in their county) and large transit operators themselves (which receive and use those funds): the Los Angeles County Metropolitan Transportation Authority (LA Metro) in Los Angeles County and the Orange County Transportation Authority (OCTA) in Orange County. We discuss some of the implications below of this consolidation of funder and recipient in one agency.

While the federal, state, and local/regional funders of transit subsidies often have specific and detailed financial reporting requirements, how budgets are organized and publicly presented can vary substantially from agency to agency. Annual operating budgets are typically assembled and reported separately from capital budgets. Further, operating or capital budgets can vary as they move from prospective to current to retrospective. Further still, such budgets can be in draft form, proposed, adopted, amended, or audited. Transit agencies budget (and report ridership and service data (Wasserman and Taylor, 2021)) on a fiscal year basis. Most, but not all, Southern California operators' fiscal years run from July 1 to June 30 (FTA, 2021b); Fiscal Year (FY) 2022, for instance, runs from July 1, 2021 to June 30, 2022.

Methods

To explore the financial condition and outlook of public transit in Southern California since the start of the pandemic, we drew on a number of quantitative and qualitative data sources. Because the effects of COVID-19 on transportation seem—and, in many ways, are—so novel, we sought to ground and contextualize them by reviewing prior academic studies, industry reports, news articles, webinars, and other published materials. To assess the costs, subsidies, and funding for transit service during the pandemic, we drew on the National Transit Database (NTD), a dataset compiled by the Federal Transit Administration (FTA) of transit use, service, expenses, and funding (FTA, 2021b). The NTD has monthly ridership data and annual financial data, the latter categorized by "Report Year," a compilation of each reporting agency's fiscal year (Wasserman and Taylor, 2021). As we discuss below, the three federal stimulus bills represented a critical lifeline to transit agencies, but funds from these bills are not disaggregated in the NTD and the latter two bills are too recent to be included in the latest annual time-series NTD release. Therefore, we also collected, from board meeting documents and communications with staff, data on the allocations of stimulus funds by operator from each of the five county transportation commissions in the Southern California region. Additionally, we interviewed FTA staff for national context for the expanded federal role in local transit funding during the pandemic.

To delve deeper into the specific situations of Southern California operators, we took a sample of all operators in the region to study their budgets and interview their staff. From the 99 transit agencies we identified in the SCAG region, we selected 31 operators for our sample:

- 20 large and medium-sized operators, which each carried at least 0.1 percent of the region's total pre-pandemic trips:
  - LA Metro, which is by far the largest transit operator, and
  - 19 others chosen randomly;
- Five small operators, chosen randomly, which each carried between 0.01 and 0.1 percent of regional trips;[4]
- Five very small operators, chosen randomly, which each carried less than 0.01 percent of regional trips;[5] and
- One tribal transit operator, chosen randomly

LA Metro dwarfs all other operators in the region. This one system, the third-largest in the U.S. by ridership, carried more pre-pandemic trips (over 65%) than all other operators in the SCAG region combined and supplied 40 percent of the region's vehicle-hours of revenue service. We thus specifically included LA Metro in our sample

[4]. Equivalently, between 0.5 and 0.25 percent of pre-pandemic regional trips excluding LA Metro

[5]. Equivalently, less than 0.25 percent of pre-pandemic regional trips excluding LA Metro

and outreach, given its outsized influence on transit in the region. We did not design our sample to be used for rigorous statistical evaluation. Rather, we chose the sample to form a representative set of case studies. These agencies we examine span the geographic, modal, and service diversity within the region, collectively offer a holistic picture of Southern California transit's financial conditions, and capture both the "elephant in the room" operator and very small operators that often receive little study. After multiple rounds of outreach to staff at these sampled agencies, 13 operators (42%) provided us with detailed budget documents. Seven of these 13 agencies provided us with additional context and financial information in a first round of focused one-on-one interviews with the research team in the summer of 2021. As the pandemic progressed, we conducted a second round of interviews in December 2021; these were a broader qualitative discussion of operator finances, planning, responses, and current issues. In this second round of interviews, we reinvited participation across our entire sample and ultimately interviewed finance staff (in some cases, joined by operations and planning staff) at eleven agencies (35%).

Finally, our research team conducted a survey of transit operators on financial effects of the pandemic, with a stratified random national sample and an oversample of all members of the California Transit Association and California Association for Coordinated Transportation. Responses were open from November 2021 to January 2022. This survey was conducted for another research project, and analysis of responses to it is ongoing. Moreover, the survey was not designed to reflect the Southern California region in particular; however, staff at 22 operators in the region responded, though some skipped some questions. Thus, while we anticipate complete findings from the survey in forthcoming research, at a few points in this report, we do draw on survey responses to confirm or complement our findings from the other methods described above.

Now two years into this global pandemic, analyses of its effects on travel, transit use, and public finance are still emerging, especially as systematic, apples-to-apples data across neighborhoods, regions, and operators can lag months or even years between collection and dissemination. For this reason, to supplement our own interviews and data analysis, we draw on media reports and rapid-response papers. Likewise, our analysis of data sources like the NTD rely on certain assumptions and estimations (which we describe in relevant sections) to overcome these data lags. Future, retrospective scholarship will be able to more systematically refine these figures with data made available in the years to come.

National Overview and Context

Transit and Public Health during a Pandemic

As a general rule, public transit (which congregates people together on vehicles and at stations and stops) and communicable respiratory diseases (which spread when people congregate together) do not mix. And during epidemics and pandemics, public transit systems see costs climb and fare revenues plummet. Indeed, the COVID-19 pandemic put U.S. public transit in a position it had not been in since the 1918 Spanish flu pandemic.

But around the world, transit has faced public health crises more recently. For example, during the 2015 outbreak of Middle East Respiratory Syndrome (MERS) in South Korea, transit patrons were far less likely to use stations near known MERS hotspots (Kim et al., 2017). Patrons with greater control over their daily schedules (e.g., retirees) were more likely to reduce their transit use than patrons with less autonomy (e.g., students taking exams). In the U.S., a study examined whether transit use at the city level predicts community transmission of influenza in 121 cities from 2006 to 2015 (Howland et al., 2020). Contrary to narratives posed at the start of the COVID-19 pandemic (Harris, 2020), most of the authors' model specifications found a statistically significant *negative* correlation between city-level flu/pneumonia rates and transit commuting—i.e., transit-using cities had less spread. Two characteristics of transit users may have dampened respiratory viral spread: many riders do not speak to others on transit, and riders typically try to avoid physical contact with others (Howland et al., 2020). Other studies have indeed found a positive relationship between transit use and disease spread, though perhaps not to the degree that might be assumed. Summing up prior studies, Ding and Taylor (2021) conclude that while the literature suggests a positive association between transit use and the spread of respiratory illnesses in observational studies, simulation studies generally predict that transmission rates will be lower on transit than in other locations such as households and workplaces. Because the "society-wide" context (travel shutdowns, traveler behaviors such as mask-wearing, etc.) matters more than transit operators' responses per se, they conclude that "arguing in the abstract about whether riding public transit is inherently safe or dangerous during a pandemic is a bit like arguing about the area of a rectangle knowing only the length of one side" (Ding and Taylor, 2021, p. 3).

Expanding on these previous studies, scholars during the COVID-19 pandemic have examined various dimensions of public transit and public health. While an initial report pinpointed the New York City subway system as the major nexus of COVID-19 spread (Harris, 2020), other analyses have refuted this finding (Sam Schwartz Consulting, 2020; Furth, 2020; Levy, 2020; and Ding and Taylor, 2021). Studies have highlighted strategies that can mitigate the risk of disease spread on transit, including air filters that reduce airborne virus loads and aerosol disinfection systems (Saha, Quadir, and Godavarthy, 2021). The relationship between transit, travel, and disease spread may also change over the course of the pandemic. Muley, et al. (2020) find that travel restrictions are more effective in the beginning stages of a pandemic, with passenger behavioral responses (such as mask-wearing) becoming more important as the disease spreads.

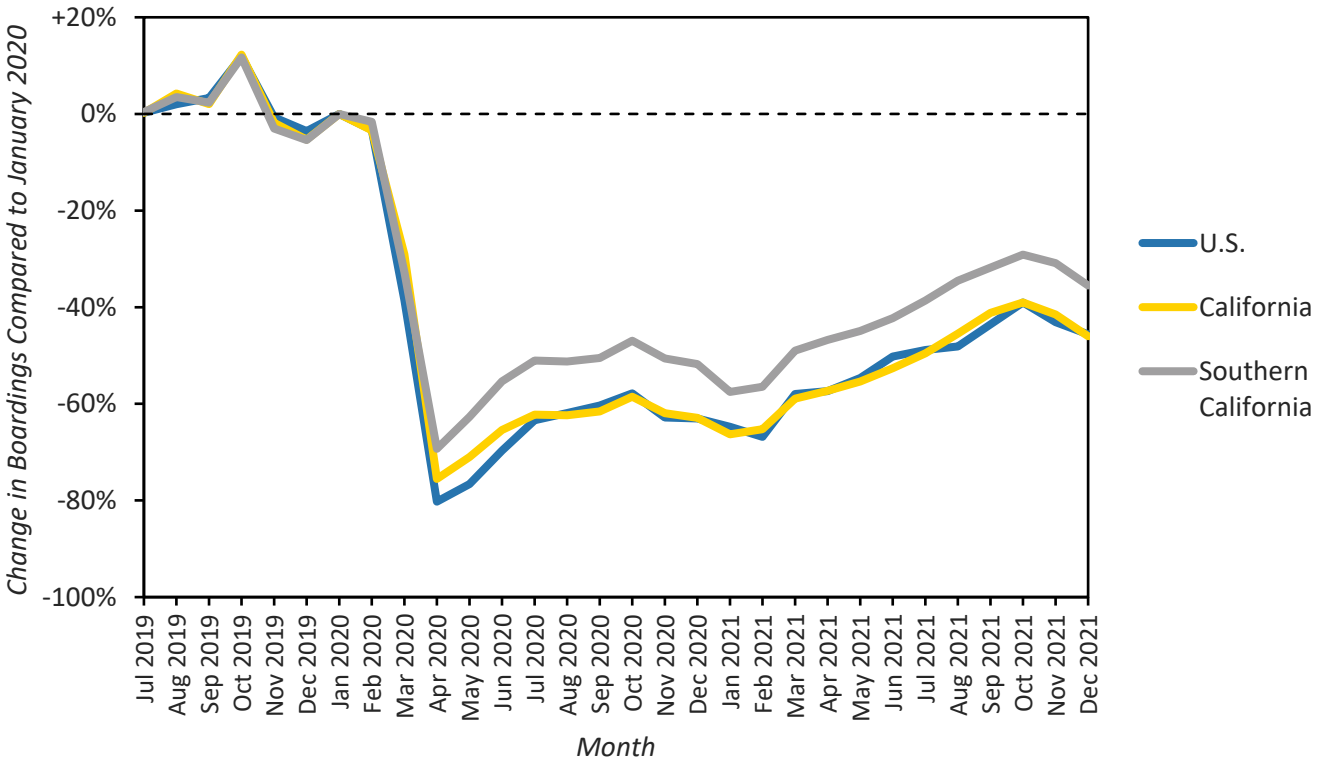
In a sign of the extraordinary times, transit agencies and other governmental bodies in mid-2020 employed a previously unheard-of strategy in an attempt to limit person-to-person viral transmission: telling people not to ride. LA Metro, for example, produced public informational materials discouraging transit use, except for essential workers traveling to and from work and those making trips for a small number of essential purposes (LA Metro,

2020a, 2020b). Limiting the number of riders could allow operators to comply with social distancing protocols without increasing service frequency or adding additional vehicles.

Short- and Long-term Effects of the Pandemic on Travel Nationally

Transit operators adapted to the pandemic in the face of unprecedented changes in people's travel patterns and demand for transit service. Across the U.S., monthly transit ridership fell 80 percent between January and April 2020; California ridership fell 76 percent (among agencies that report monthly data) (See **Figure 1**) (FTA, 2021b). In different cities, ridership declines frequently began before COVID-19 cases in an area started rising sharply, with shut-down orders and news reports depressing transit use and changing other travel patterns in advance (especially in areas where survey respondents reported lower risk tolerances) (Liu, Miller, and Scheff, 2020 and Chan et al., 2020). While ridership unevenly recovered over the next year and a half (See **Figure 1**) (FTA, 2021b), surveys throughout the pandemic found a shift away from transit in terms of both number and percentage of trips made (Ehsani et al., 2021 and Circella, 2020). While active modes of transportation like walking and biking—outdoor, COVID-safe forms of both mobility and recreation—flourished during the pandemic (especially

Figure 1. Changes in Monthly Transit Boardings during the Pandemic



Note: Data do not include very small and rural operators that do not report monthly to the NTD.

Data source: FTA, 2021b

as cities closed certain blocks and streets to vehicles), crowded transit vehicles were, in contrast, widely perceived as unsafe (Dunning and Nurse, 2021).

The decline in transit use, though, was uneven geographically and socioeconomically. While ridership declined among lower-income travelers with little or no access to private vehicles, it largely vanished among more affluent commuters to central business districts and other office centers. As a result, routes and systems that carried higher proportions of lower-income, low-auto-access travelers before the pandemic lost proportionally fewer riders in the pandemic. Such riders are more likely people of color, immigrants, and women, and more likely "essential workers" (Paul and Taylor, 2022 and Liu, Miller, and Scheff, 2020). Essential workers continued to ride as "non-essential" workers left transit in droves (as part of, according to Salazar (2021), a larger societal recategorization and reevaluation of mobility and the workforce).

Over the course of the pandemic, peak-period transit trips to job centers, like central business districts, have recovered more slowly than other trip purposes, especially among white-collar workers. With working-from-home persisting, at least part-time, for many workers, many transit operators are predicting such depressed travel patterns will remain for at least the medium term (Lazo, 2021a and Kamisher, 2022). Outside of urban areas, though, adults living in rural areas reported less disruption to their life overall and their transportation needs in particular (D. Wang et al., 2021), and rural transit systems typically lost many fewer riders as a result.

Pandemic-induced changes in transit demand appear likely to last, to at least some degree. In a recent survey, respondents reported that even after the pandemic, they would be less willing to ride transit than before (Awad-Núñez et al., 2021). Indeed, the pandemic may be changing residential preferences, to the detriment of transit ridership: a recent *New York Times* article described how many people returning to in-person jobs are putting higher value on living within walking distance of their workplace and less value on having good transit access to work (Cohen, 2020). Considering travel patterns broadly, the pandemic represents the type of disruptive event that can change otherwise relatively fixed travel habits and during which transportation policy interventions may be more lastingly effective (L. Wang and Wells, 2020)—if, of course, they are enacted in a timely manner (Sengupta and Plumer, 2020).

What might draw riders back? Interestingly, a survey from Spain indicated that, while most respondents were at least open to using transit after the pandemic, almost two-thirds would pay more for transit with extra sanitizing measures. Seventy percent reported that they would be more likely to use transit post-pandemic if operators increased service to reduce crowding, with 53 percent willing to pay more for such improved service (Awad-Núñez et al., 2021).

Transit Agency Responses to the Pandemic

Operational Changes

Once stringent initial public health restrictions began to ease in the summer and fall of 2020, transit agencies began taking steps to bring back riders while keeping them and their vehicle operators safe. To reduce both actual viral spread and fear of it among riders, transit operators implemented strategies to alleviate crowding and allow for social distancing. But because transit is most effective—and per-rider subsidies are lowest—when many people ride, reducing transit vehicle occupancy to enable social distancing significantly increases per-rider costs and runs directly counter to transit's core business model.

Some seemingly overnight, “high-performing” transit shifted from being nearly full buses and trains to where anything more than a quarter of the seats occupied might be considered crowded. But what constituted “crowding,” either during or before the pandemic, was never clear. Comparisons are complicated because most transit operators lack a definition of “crowding,” and those that do have one often differ. Among 200 U.S. transit operators, 46 percent had a publicly available, pre-pandemic definition of crowding, and 42 percent had pandemic definitions of crowding available (which tended over time to have lower rider thresholds for considering a vehicle “crowded”). To reduce crowding, operators took actions at stops (including limiting the number of people allowed at stations, marking off waiting areas, closing lobbies, and roping platforms and seats off) and on vehicles (including implementing rear-door boarding and egress, partitioning off the driver’s cabin with barriers, taping a line behind the driver, blocking off seats, and limiting vehicle capacities). Agencies also deployed bigger or better-structured vehicles. These strategies were often accompanied by active enforcement of compliance by drivers, agency staff, and police, while public outreach and communications strategies sought to inform riders of these changes (Dai and Taylor, 2020; Dasmalchi, 2020; Kamga and Eickemeyer, 2021; and Sanquinetti et al., 2021).

Beyond social distancing, transit operators tried early on to reduce virus transmission through improved cleaning, ventilation, and air filtration;[6] mask wearing and mask requirements; and eliminating fares, fare enforcement, and/or cash transactions for ticket sales (Kamga and Eickemeyer, 2021; Ding and Taylor, 2021; Seider et al., 2020; and Speroni, Taylor, and Hwang, forthcoming). In addition, agencies modified their service, sometimes by increasing service frequency to reduce crowding but more often by scaling back hours, headways, and routes in response to declining demand and shrinking revenues and by prioritizing service for essential travel (Speroni, Taylor, and Hwang, forthcoming). In Washington, D.C. and many other cities, operators responded to observed changes in demand by replacing peak-period service levels and commuter and express routes with off-peak and/or weekend services at all times to accommodate less temporally and spatially concentrated pandemic demand (Lazo, 2021a).

Data and communication strategies also took on new importance for transit agencies. For example, Frick, et al. (2020) note that General Transit Feed Specification (GTFS) data, a standardized format for transit route and schedule information, has a special role to play during emergencies and service disruptions such as those seen during COVID-19. GTFS data can also be a public health tool, to the extent that real-time transit vehicle occupancy data allow riders to minimize the time they spend on/near crowded transit vehicles and stations. However, just over half of California transit operators published static GTFS data in April 2021, and only 19 percent published real-time vehicle data that would allow travelers to monitor vehicle crowding in real time.

Financial Repercussions and Fare-free Transit

Among transit agencies’ many pandemic responses, the one with perhaps the most direct financial consequences was suspending fares. Many transit operators across the country stopped collecting fares from their remaining riders, either by formally eliminating fares or by implementing an “honor system” without any fare enforcement checks nor fare payment requests from vehicle operators (Loukaitou-Sideris et al., 2020). Along with rear-door boarding, suspending fares reduced interaction (and therefore potential viral spread) between drivers and passengers. Agencies may also have suspended fares in part to help those riders who had difficulty paying due to the economic downturn, business closures, and layoffs at the start of the pandemic. Agencies suspended fares for other reasons as well: some, like New Jersey Transit, offered free rides to those getting vaccinated (NJ Transit,

[6]. Hoffman et al. (2022) ran a trial of using air filters on buses to explicitly test for the presence of SARS-CoV-2 RNA.

2022); others did not collect fares on Election Day (Smith, 2020). We discuss the financial implications of fare suspensions in Southern California below.

Fareless transit during the pandemic brought up questions of transit's social role and its relation to other policy realms. Rear-door boarding and fare suspension became a labor issue. In the San José area, after the Santa Clara Valley Transportation Authority implemented rear-door boarding and fare-free service at the start of the pandemic but ended them in August 2020, labor groups and other activists successfully pressured the agency to restore both measures in February 2021 on worker safety grounds (Marcantonio, 2021). On the other hand, fare-free transit has also attracted concerns about a rise in people experiencing homelessness using buses, trains, stops, and stations as shelter. Any increase in the use of transit as shelter, though, may have been due more to "push" factors like homeless shelters and libraries closing or reducing capacity than the "pull" of free transit. Moreover, a national survey of transit agency staff found that the lack of fare *enforcement* was more a factor than the fare itself on reported increased use of transit as shelter, suggesting that issues of policing may supersede the cost of riding in affecting unhoused individuals' travel and shelter choices (Loukaitou-Sideris et al., 2020).

Prior to the pandemic, transit systems with fare-free transit for all riders tended to be low-travel-market-share, low-farebox-recovery,[7] and/or special-purpose transit systems. On some of these systems, the costs of fare collection can exceed generated revenues; on others like National Park Service buses, covering operating costs with fare revenues is not a policy goal of the system and may even contradict the system's purpose of attracting guests out of their cars. Instead of full fareless transit, reduced and/or free fares for specific rider groups are more common. Such discounts are particularly common for older adults, riders with disabilities, and low-income riders (Saphores, Shah, and Khatun, 2020).

In contrast, the widespread pandemic fare suspensions represented a departure from the norm, motivated by different goals in a far different context than was the case with fare-free transit prior to the pandemic. Since 2020, almost all systems in Southern California that suspended fares have restored them. However, a few cities have permanently adopted fare-less transit, citing the potential to increase ridership and support the most economically precarious travelers (who disproportionately rely on transit services) during the recovery from the pandemic. The City of Albuquerque decided to keep its ABQ RIDE system fare-free for all of 2022, with plans in the works to extend it indefinitely thereafter (KOB-TV, 2021). Kansas City rolled out fare-free transit just prior to the pandemic and plans to continue it for the foreseeable future (Ziegler, 2021), and Boston is piloting fare-free service on select routes (Crowe, 2021). And as Alexandria, Virginia permanently removed fares on its bus system, other operators in the Washington, D.C. area are considering reducing fares for low-income riders as well (Lazo, 2021b).

After the passage of the second and third federal stimulus bills and the mostly strong economic recovery in 2021, media and industry reports on lost transit riders, fare revenues, and systems facing dire financial consequences ebbed. In New York, the prospect of further federal funds influenced the Metropolitan Transportation Authority's approved budget in December 2021, even before President Biden was inaugurated, the bare Democratic majority in the Senate was decided, or details of the latest stimulus bill were set (Goldbaum, 2020b). Advocates in San Francisco and Los Angeles, meanwhile, pressed for faster service restorations after available transit subsidies turned out higher than expected (Cano, 2021 and Linton, 2021b). However, lingering questions remain, especially concerning how the fiscal impacts of COVID-19 interact with longer-term trends in ridership and revenues. Reports from New York City and Seattle note that costs of construction, land acquisition, consultants, and other

[7]. Farebox recovery, often expressed as a ratio, refers to the share of total transit system operating costs covered by passenger fare revenues.

budget categories rose both before and during the pandemic, absent significant steps taken to address them (Berger, 2020 and Aiyer, 2021). In Boston and the San Francisco Bay Area, watchdog groups and financial analysts forecast financial cliffs for their agencies by around 2024, with downtown office workers slow to return and without new revenue sources (Dolven, 2021; CBS SF, 2021; and Kamisher, 2022). In Washington, D.C., transit board members debated whether a bond issue was sound, given uncertain ridership and revenue forecasts, already high debt, and a huge backlog of deferred maintenance needs, though they ultimately approved it (George, 2021a).

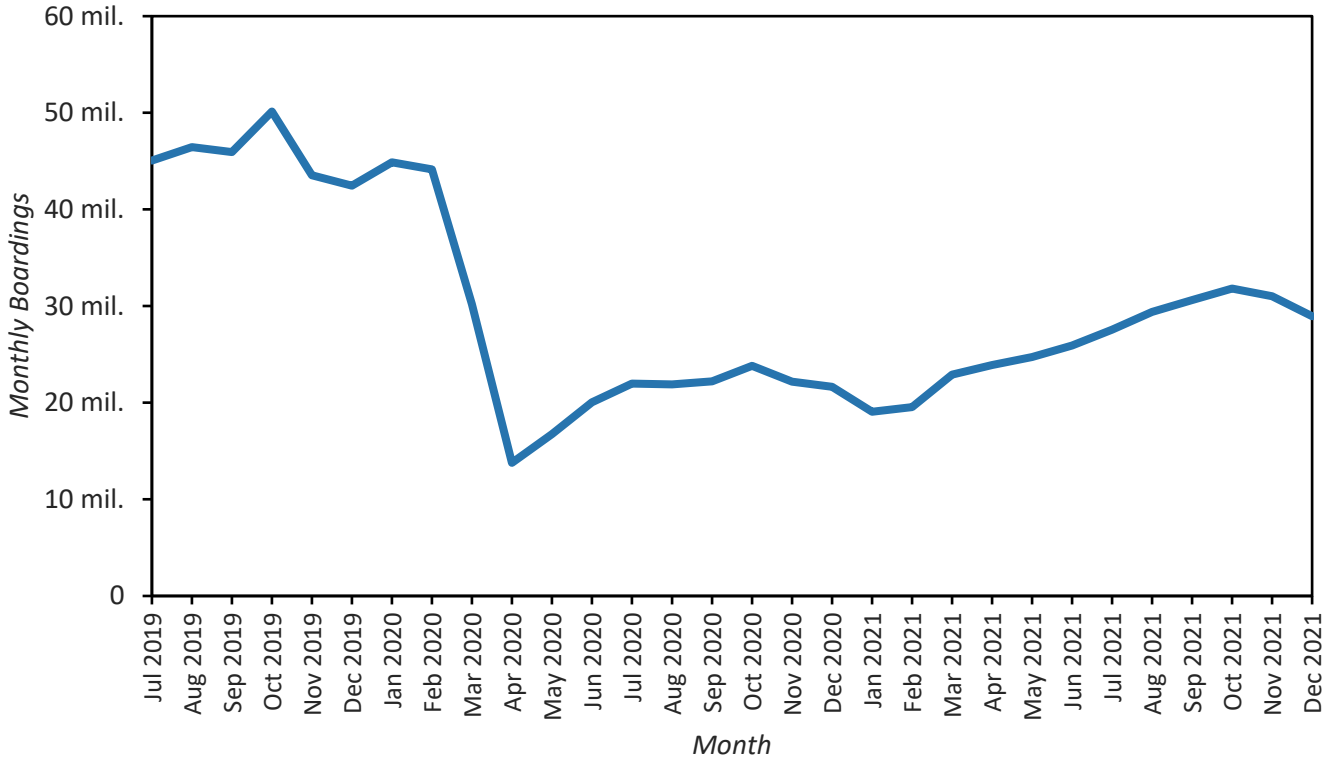
Effects of the Pandemic on Transit Finance in Southern California

Initial Financial Shortfalls

Drastic Declines in Ridership with a Slow Recovery

As with public transit across the globe in the spring of 2020, ridership across Southern California cratered (See **Figure 2**). Among reporting agencies, monthly boardings dropped 69 percent between January and April 2020, a loss of over 31 million monthly trips (FTA, 2021b). And as with transit in most places, the ridership decline in Southern California was accompanied by steep losses in fare revenues, increased need for subsidies to serve those riders that remained, and a host of operational challenges.

Figure 2. Southern California Monthly Transit Boardings



Note: Data do not include very small and rural operators that do not report monthly to the NTD.

Data source: FTA, 2021b

As compared to the U.S. overall (which is heavily weighted by high ridership in New York City), transit riders in Southern California are disproportionately essential workers, particularly low-income riders and riders of color (A.

Walker, 2022). Because these rider groups were more likely to continue riding during the pandemic (Paul and Taylor, 2022; Liu, Miller, and Scheff, 2020; and TransitCenter, 2020a), overall transit ridership in Southern California fell proportionally less compared to its pre-pandemic baseline than for California or the nation overall. (See **Figure 1**). Since May 2020, monthly transit ridership as a percentage of January 2020 (pre-pandemic) ridership in Southern California has held steady at between seven and 14 percentage points above the whole U.S. (FTA, 2021b). This relatively robust performance was hardly a silver lining, particularly before vaccines became widely available, as the region's sizable transit-dependent essential worker population risked infection not only at their jobs, but also when riding transit to and from them. And despite efforts by many agencies to keep crowding on vehicles to a minimum, fiscally- and labor-driven service cuts early in the pandemic increased passenger crowding on many lines in spite of depressed demand (Hymon, 2020a).

Fiscal Uncertainties

As noted earlier, on top of falling ridership and corresponding fare revenue losses, transit agencies in the region anticipated massive cuts in subsidies in the early months of the pandemic due to widespread tax revenue losses. Projections developed in the early months of the pandemic predicted dramatic declines and a protracted recovery of key revenue sources for transportation in California, including from state motor fuels taxes (due to depressed driving) and vehicle registration fees. The worst-case scenario in Agrawal et al.'s (2020) projections foresaw transportation tax and fee losses potentially lingering well into the 2030s due to long-term macro-economic damage caused by the pandemic. At LA Metro, an interviewee recalled their financial forecasts anticipating $1.8 billion in losses over two years. Thankfully, these dire forecasts, while widely viewed as plausible at the time, did not come to pass for reasons we explain below.

Rising Costs

As noted above, transit agencies not only had to address the chaotic operational challenges of running an essential service in the early months of the pandemic, but also faced rising costs to supply that service. Apples-to-apples data on operating costs from the National Transit Database are only available, as of writing, through the end of Fiscal Year 2020, so we are only able to comprehensively examine these increased costs at the beginning of the pandemic. In those uncertain early months, transporting each rider who remained on transit required substantially higher subsidies than before the pandemic, due both to scale diseconomies (i.e., many fewer passengers per unit of service supplied) and to COVID-19 safety protocols, such as for additional vehicle cleaning (FTA, 2021b).

For all but three small Southern California operators that report to the NTD (which we have excluded from the calculations in this section), Fiscal Year 2020 ran from July 1, 2019 to June 30, 2020 (FTA, 2021b). Therefore, the FY 2020 figures in **Table 2** cover a period that included about eight months before the pandemic (July 2019 to February 2020) and four during it (March 2020 to June 2021). The costs and subsidies during these initial pandemic months alone, could they be consistently isolated, were likely much higher.

As ridership and fare revenues plummeted, per-rider subsidies for the riders left on the system grew (See **Table 2**). We calculated the total subsidy each fiscal year as the difference between operating expenses and fare revenues and then divided that total subsidy by fiscal year boardings. Across the region, the subsidy per rider increased 27 percent between FY 2019 and FY 2020. The rise in subsidy was even higher on smaller agencies. Thus, the mean subsidy per rider across operators (not weighting by ridership) rose almost $5, or 35 percent, and the median went up $3. On all but four of the 92 operators included in **Table 2**, the subsidy per rider rose (FTA, 2021b).

Table 2. Rising Subsidies and Costs in Southern California Transit

Statistic	Fiscal Year	Weighted Mean of Southern California Operators	Unweighted Mean of Southern California Operators	Median of Southern California Operators
Operating cost per revenue service hour	FY 2019	$155.97	$97.91	$81.47
	FY 2020	$168.12	$110.77	$98.07
	Difference between FY 2019 and FY 2020	$12.15 (+8%)	$12.86 (+13%)	$9.87
Subsidy per boarding	FY 2019	$5.18	$14.21	$8.81
	FY 2020	$6.56	$19.13	$11.61
	Difference between FY 2019 and FY 2020	$1.37 (+27%)	$4.91 (+35%)	$3.01

Note: Excludes three Southern California transit operators whose fiscal years do not end June 30th.

Data source: FTA, 2021b

Several factors could account for these rising subsidies per rider. First, as noted previously, many agencies suspended fare collection early in the pandemic (and towards the end of FY 2020) and even on agencies that continued to collect fares, the riders who remained were more likely to be those who qualified for low-income or other price discounts. Furthermore, operators across the region cut service hours only about half as much as their ridership dropped between FY 2019 and FY 2020 (FTA, 2021b). With more service per rider, serving each remaining rider became more expensive.

Finally, and irrespective of patronage changes, the operating cost per hour of service increased during the pandemic (and recall that FY 2020 captured only four months of pandemic service) (See **Table 2**). Across the region, each revenue service hour was about $12 more expensive in FY 2020 than in FY 2019, with similar increases in the unweighted mean and median across operators. All but nine of the 92 operators reflected in **Table 2** paid more per hour of service in FY 2020 than in FY 2019 (FTA, 2021b). With bus and train operators frequently out sick and others leaving due to health or other concerns (discussed further below), overtime hours likely rose, contributing to rising operating costs. Interviewees told us that the additional costs of antiviral cleanings, personal protective equipment, and other COVID-19 health and safety protocols raised their operating costs as well. In addition, even at agencies that cut service, fixed overhead costs (vehicles, equipment, mechanics, human resources, etc.) often changed little when service was reduced, so any cost savings tended to be proportionally smaller than the service cuts.

Decreased Fare Revenues

As the costs of supplying transit rose and ridership fell, agencies collected far less in fare revenue. As discussed briefly above, the decline in fares was two-fold. First, of course, fewer riders meant fewer fares. But also, most agencies in the region suspended fare collection or fare enforcement for at least part of the pandemic, especially in its early months. Of the 19 operators in the region that responded to this survey question, just two (11%) reported collecting fares as normal throughout the pandemic. The rest (89%) reported removing fares altogether

or at least suspended fare enforcement checks and operated on a fare payment “honor system.” Across these agencies, these suspensions lasted for a minimum of two months; on some operators, fare collection remains suspended as of this writing.

Due to ridership losses and fare collection suspensions, fare revenues in the region dropped considerably. In the NTD’s pre-pandemic Report Year 2019, all reporting Southern California operators combined collected $552 million in fares. In Report Year 2020, that total fell to $407 million. And, of course, because these data combined eight months of pre-pandemic service and four months of pandemic service, this 26 percent drop underestimates the full fiscal effect of COVID-19 on fare revenues (FTA, 2021b). While Report Year 2021 NTD data are not yet available, we do have further insights from survey responses. Before the pandemic, the farebox recovery ratio ranged from five to 33 percent among responding agencies (save for the Anaheim Transportation Network, discussed in detail later in this report, with an exceptional 85% farebox recovery rate). As of this winter, however, ratios among respondents had fallen to between 13 percent and zero. Every responding operator reported a decrease in their farebox recovery rate in the pandemic.

This loss of fare revenue unquestionably strained agency operations and finances. However, agency governing boards and their managers had to balance a wide array of concerns beyond lost fare revenues during the pandemic. For example, according to interviewees at LA Metro, whose board includes Los Angeles County supervisors and city councilmembers from around Los Angeles County, board members sought to implement and maintain fare-optional service for as long as they did to enable economically precarious passengers to ride transit and have extra money to pay for food, healthcare, shelter, and so on.

The relationship between LA Metro and Access Services, the county’s paratransit[8] provider, also had implications for fare revenue during the pandemic. We explore their relationship in detail below, but with respect to fares, one key element is relevant: paratransit providers are limited under federal regulations to charging at most twice the fare of fixed-route transit for a similar trip (FTA, n.d.-a). Yet, an honor system on LA Metro, without fare enforcement but with a fare still technically on the books, allowed Access Services to continue to charge its usual fares. This may have stabilized Access Services’ budget compared to other operators that experienced fare revenue drops, especially given how costly paratransit service is per rider. However, Access Services staff reported that fare revenues only covered five percent of its operating expenses pre-pandemic and four percent in fall 2021, less than other transit operators in the region (FTA, 2021b and Metrolink, 2016). This also created a disparity throughout much of the pandemic: the largest fixed-route transit operator was effectively free for all riders for almost two years, while companion paratransit continued to charge pre-pandemic fares.

New and Existing Revenue Sources Helped Transit

This section provides an overview of transit subsidy funding in Southern California. We focus in particular on public transit funding contained in the three enormous and unprecedented federal pandemic relief bills and on local option sales tax funding, which is an especially important revenue source for Southern California transit operators. LOSTs both crashed alarmingly at the outset of the pandemic and have recovered since then to a remarkable degree.

---

[8]. Paratransit is the generic term used to describe specialized van services for elderly and disabled travelers.

Federal Stimulus Funding Overview

During the pandemic, the federal government provided a new revenue source for transit operations at a scale never seen before. The three stimulus bills—the CARES Act in March 2020, the CRRSA Act in December 2020, and the ARP Act in March 2021—collectively provided Southern California transit operators $4.39 billion (around 6% of the national total, which is slightly higher than the region's share of the national population). As described in the introduction, these bills each came at critical moments for the transit industry. The three federal stimulus bills proved to be godsends for transit operators in Southern California, allowing them to (often more than) fill the holes left by lost fare revenues and other revenue declines (FTA, 2021b, 2021c, 2021g; USDOT, 2021; LA Metro staffer, 2021; OCTA staffer, 2021; RCTC staffer, 2021; SBCTA staffer, 2021; VCTC staffer, 2021; and U.S. Census Bureau, 2020).

The three bills that contained this funding for transit also provided federal support for state and local governments more broadly, as well as checks to individuals and families, loans and grants to businesses and other efforts to stabilize and revive the economy during the pandemic. The transit funding within these bills represented the first significant federal effort to fund transit operations (beyond a modicum of pre-pandemic operations funding for rural and small urban operators that required a higher local match than if used for capital projects) (FTA, n.d.-b). While the federal government has long provided capital support for transit infrastructure projects, paid in large part through federal fuel tax revenues (Taylor, 2017), this substantial operational support (funded primarily through federal deficit spending) was both new and deemed necessary during the pandemic.

The Federal Transportation Administration was responsible for allocating the transit stimulus funding. **Table 3** provides an overview of how the FTA distributed the three rounds of funding. The three bills had very few limitations on what they could be used for: essentially any payroll or operations expense, with other expenses like capital projects allowed if no employees were furloughed. Unlike typical federal grants to transit agencies, there was no local match requirement (FTA, 2021a, 2021c, 2021d, 2021f, 2021g).

Each of the three bills included Urbanized Area Formula Funds (§ 5307). These stimulus dollars supported urban, suburban, and exurban transit agencies, and the FTA doled them out to Census-defined urbanized areas[9] based on a multi-factor formula based on population, population density, and revenue transit service. The CARES Act, passed quickly after the start of the pandemic, utilized the pre-existing Section 5307 formula (used for federal capital transit support prior to the pandemic) but waived the 20% local match requirement. CRRSA and ARP added requirements that each urbanized area generally not exceed 75 percent and 132 percent, respectively, of its pre-pandemic total operating expenses in combined stimulus funds (See **Table 3**) (FTA, 2021a, 2021c, 2021d, 2021f, 2021g, n.d.-b and SCAG Transportation Committee, 2021).

Because the two largest urbanized areas in Southern California (Los Angeles-Long Beach-Anaheim and Riverside-San Bernardino) cross county lines, SCAG, as the region's MPO, was responsible for dividing these funds among counties. While SCAG had some flexibility in their methodology, the board distributed funds to counties using the same federal formula employed to allocate them among urbanized areas. However, there was some dispute over the CRRSA distribution formula among county representatives that delayed full allocations of those funds. Moreover, though CRRSA added the limitation that urbanized areas could not receive more than 75

[9]. An urbanized area, per the U.S. Census Bureau, is a contiguous, developed area around a settled core. These do not correspond with political boundaries. There are 13 urbanized areas in the five-county Southern California region that receive federal transit funds (U.S. Census Bureau, 2021 and FTA, 2021e).

Table 3. Transit Funding in Federal COVID-19 Stimulus Bills

Stimulus Bill	Date Passed	Fund Expiration	National Total for Transit	Eligible Uses	Additional Regulations
Coronavirus Aid, Relief, and Economic Security (CARES) Act	Mar. 2020	never	$24.9 bil.	Operating and capital expenses for responding to the COVID-19	No local match required
Coronavirus Response and Relief Supplemental Appropriation (CRRSA) Act	Dec. 2020	never	$14.0 bil.	"To the maximum extent possible," payroll and operational needs prioritized Any other use related to COVID-19 preparedness and response allowed if no employees furloughed	No local match required Urbanized Area funding: Combined CARES and CRRSA funds in a given urbanized area cannot exceed 75% of the area's Report Year 2018 NTD operating costs Rural Area funding: Combined CARES and CRRSA funds in a given state cannot exceed 125% of the state's Report Year 2018 rural NTD operating costs
American Rescue Plan (ARP) Act	Mar. 2021	must be obligated by Sept. 30, 2024 and spent by Sept. 30, 2029	$30.5 bil.	Payroll and operational needs prioritized Any other use related to COVID-19 preparedness and response allowed if no employees furloughed	No local match required Urbanized Area funding: Combined CARES, CRRSA, and ARP funds in a given urbanized area cannot exceed 132% of the area's Report Year 2018 NTD operating costs (unless the area's CARES funds were already above 132%, in which case the area could receive an additional 25% of its Report Year 2018 NTD operating costs) Rural Area funding: States that received at least 150% of Report Year 2018 rural NTD operating costs from CARES can receive another 5% from ARP. States that received 140%-150% from CARES can receive another 10% from ARP. States below 140% can receive another 20% from ARP.

Data sources: FTA, 2021a, 2021c, 2021d, 2021f, 2021g

percent of their pre-pandemic operating expenses in stimulus funds to date, some of the region's urbanized areas had already exceeded that cap from CARES alone. Those areas did not have to return CARES funds but received no CRRSA dollars. When ARP raised the cap to 132 percent, counties again had room to receive funds from ARP. Once so distributed, each county's CTC had discretion in distributing stimulus funds to its transit operators (SCAG Transportation Committee, 2021; LA Metro staffer, 2021; and SBCTA staffer, 2021).

The stimulus bills also included funding for rural and tribal transit agencies, likewise based on pre-pandemic formulas (See **Table 3**). CRRSA and ARP set aside funding for nonprofit transit providers to senior and disabled travelers, and ARP also had line items for capital projects, planning for service restoration, and competitive supplemental operating assistance (FTA, 2021a, 2021c, 2021d, 2021f, 2021g).

Across the three stimulus bills, the region received 129 percent of its Report Year 2018 operating expenses (FTA, 2021b; LA Metro staffer, 2021; OCTA staffer, 2021; RCTC staffer, 2021; SBCTA staffer, 2021; and VCTC staffer, 2021). In other words, Southern California transit operators got more than an ordinary year's worth of operating funds on top of the fares, state support, sales taxes, federal capital dollars, and other revenues they collected. Given the higher costs and extraordinary circumstances of providing service during a public health emergency, one could hardly call the situation a boon. Nevertheless, the federal government stepped in at the right time to provide a massive boost to the region's precarious transit finances.

We asked interviewees what would have happened had none of the stimulus bills passed and had their agency not received those funds. In reality, agencies did not have to consider such counterfactuals for long: the CARES Act passed quite early in the pandemic (See **Table 3**). Still, none of the interviewees mentioned having a financial contingency plan in place prior to the pandemic for such a huge shortfall. Looking back, interviewees told us that their agencies would have had to have taken drastic actions, to the detriment of their service, their employees, and ultimately their riders. The most common responses were that agencies would have cut service (in many cases, quite severely) and/or laid off staff. At agencies that did make service or labor cuts, interviewees asserted that those reductions would have been even worse. One interviewee compared this hypothetical to what happened at his previous transit agency after 9/11. In a city whose economy was hurt by 9/11, the transit system entered a vicious cycle of lower ridership, lost fare revenues, and service cuts. Without federal dollars in the COVID-19 pandemic, his agency would have entered a similar "death spiral," he believed, from which it would have been difficult to recover.

Others noted that, without federal stimulus money, they would not have had the funds to pay for additional COVID-19 safety measures like cleanings. Returning to full service would have been much more difficult as well, had bus operators been laid off and later needed to be rehired or new ones needed to be hired. Finally, many interviewees expressed a general sentiment that, regardless of the specific consequences averted, having the federal money in hand (or even just the promise of it) provided peace of mind for agency employees and their riders. Staff could spend less time on worst-case financial planning and more on the many other operational challenges necessary to address. One interviewee noted that the funds helped reduce staff worries and burnout, at a time when many were considering leaving (though many, of course, did).

Agencies spent their stimulus funds in a variety of ways. For the most part, operators spent stimulus dollars on operational costs of service—primarily labor (including for higher-than-normal sick leave use and overtime for remaining operators to cover shifts missed by others) but also maintenance and overhead. The funds covered a number of expenses specific to COVID-19 as well: hiring and supplying sanitization crews, adding barriers in buses to protect operators, testing staff for COVID-19, and even providing breakfast and lunch for operators so

they could avoid exposure at restaurants. Because a number of operators received more in stimulus funds than their immediate operating needs in Fiscal Year 2021, agencies also used funds for capital projects (such as charging stations and infrastructure for electric buses) or other efforts (such as new payroll and scheduling software). To be clear, given the increased costs of providing service discussed above, the stimulus funds did not leave most operators flush with cash. In a few cases, though, operators prioritized spending federal funds quickly and saved or displaced local dollars for future use. Overall, interviewees appreciated the fewer strings attached to stimulus transit funds, enabling them to react to a novel crisis flexibly.

Federal Stimulus Funding Allocations to Areas and Agencies

While all agency staff we interviewed described the great value of stimulus funds to their agencies, the funds were distributed variably across transit operators and counties, based on a variety of metrics. **Table 4** presents statistics on the division of stimulus funding, summed across the three bills, by county. Given the federal formulas governing the funds, Los Angeles County received the most total stimulus dollars as well as funds per person, as the densest in the region with the greatest transit ridership and service per capita (FTA, 2021b and U.S. Census Bureau, 2020). It received 2.5 times more stimulus funds per resident than the next-highest county, Orange. Yet by other, operator-based metrics, Los Angeles County lagged behind its peers. While LA Metro dwarfs all other operators in size, the county has many more operators. Indeed, Los Angeles County is home to far more transit agencies than other counties in the region, especially smaller, municipal operators. Some areas of the county fall within at least three overlapping service areas (LA Metro, 2022b). Because of this, the stimulus funds had to be divided many ways, leaving Los Angeles County operators with, on average, a lower share of their pre-pandemic operating expenses covered by stimulus funds. In contrast, Ventura received the least federal stimulus funding among the five Southern California counties yet had the highest share of pre-pandemic operating costs covered (LA Metro staffer, 2021; OCTA staffer, 2021; RCTC staffer, 2021; SBCTA staffer, 2021; VCTC staffer, 2021; FTA, 2021b; and U.S. Census Bureau, 2020).

County transportation commissions had a fair bit of leeway in distributing stimulus funds to operators within the urbanized areas in their county. Note that CRRSA and ARP (and SCAG guidelines covering them) established caps on stimulus funds by *urbanized area* and by *county* but not by *operator*. So, while an urbanized area or county could ultimately receive no more than 132 percent of its pre-pandemic operating expenses in stimulus funds, a particular operator within that area could exceed that cap. In more outlying parts of the region, the distribution was simple: for instance, Victor Valley Transit is the only transit operator in the Victorville-Hesperia urbanized area and thus received all of the stimulus funds for that area. But in the larger urbanized areas—particularly the massive Los Angeles-Long Beach-Anaheim area, touching all five counties and covering most of the population of Los Angeles and Orange Counties—the distribution among many operators involved considerable negotiation and trade-offs (FTA, 2021a, 2021d, 2021f, 2021g; SCAG Transportation Committee, 2021; SBCTA staffer, 2021; LA Metro staffer, 2021; and U.S. Census Bureau, 2010).

There were a number of ways to divide funds. At first, under CARES, CTCs could extrapolate the formula used to distribute stimulus dollars across urbanized areas down to the operator level. The Ventura County Transportation Commission did this, but because miles of rail service factored significantly into the formula, the commuter rail operator Metrolink would have received a share of the funds VCTC deemed disproportionate. Therefore, when VCTC took countywide planning funds out of CARES (an allowable expense), it took the largest share from Metrolink's allocation to even out distributions. Other CTCs, like LA Metro and RCTC in Riverside County, took a

different approach, estimating anticipated losses in other funding sources by operator and allocating stimulus funding primarily in proportion to them (VCTC staffer, 2021; LA Metro, 2020c; LA Metro staffer, 2021; SBCTA staffer, 2021; and RCTC staffer, 2021).

Table 4. Allocated Federal COVID-19 Stimulus Funding by County

County	Total Transit Stimulus Funding	2020 Population	Transit Stimulus Funds per Person	Report Year 2018 Operating Costs	Percent of Pre-pandemic Operating Costs Covered by Stimulus Funding	Transit Operators Receiving Stimulus Funding
Los Angeles	$3,166 mil.	10.0 mil.	$315	$2,491 mil.	127%	59
Orange	$394 mil.	3.2 mil.	$124	$291 mil.	136%	3
Riverside	$177 mil.	2.4 mil.	$72	$116 mil.	153%	6
San Bernardino	$186 mil.	2.2 mil.	$85	$119 mil.	156%	6
Ventura	$85 mil.	0.8 mil.	$100	$51 mil.	166%	8
Multi-county operators, small paratransit operators, and special projects	$380 mil.	N/A	N/A	N/A	N/A	19
Total	**$4,389 mil.**	**18.6 mil.**	**$214**	**N/A**	**N/A**	**101**

Note: Figures may not reflect stimulus funds not allocated to operators at time of writing.

Data sources: LA Metro staffer, 2021; OCTA staffer, 2021; RCTC staffer, 2021; SBCTA staffer, 2021; VCTC staffer, 2021; FTA, 2021b; and U.S. Census Bureau, 2020

When CRRSA and ARP passed, pre-pandemic operating expenses became the new measure for distributing stimulus funds across urbanized areas. The Southern California CTCs faced a choice: interpret the spirit of CRRSA and ARP to mean that operators, too, should receive the rest of their stimulus funds proportionately to their pre-pandemic expenses or continue to allocate stimulus funds by current needs and projected shortfalls, regardless of how that matched up to pre-pandemic expenses. RCTC and SBCTA in San Bernardino County chose the former, shifting away from the way they allocated CARES dollars based on the changed structure of the two subsequent bills. This required distributing ARP funds a little unevenly, in order that each operator's total funding across all three stimulus bills covered relatively similar shares of their pre-pandemic operating costs. LA Metro, however, continued to distribute all of its stimulus funds based on projected and actual losses from other sources, primarily sales tax revenues (FTA, 2021d, 2021f, 2021a; RCTC staffer, 2021; SBCTA staffer, 2021; and LA Metro staffer, 2021).

The way LA Metro allocated stimulus funding hinges on a key distinction between two types of operators in the county. Under state law and LA Metro rules, 17 operators in the county fall under the Formula Allocation

Procedure: LA Metro itself and a set of "legacy" operators,[10] most larger municipal agencies that existed prior to the county's sales tax measures.[11] These operators split major revenue sources allocated to the county, like federal capital dollars, state fuel taxes, state transit operational support, and the discretionary portion of county sales taxes. The rest of the county's transit agencies—smaller and generally established more recently than the Formula Allocation Procedure—are not eligible to claim these funding sources. They rely instead on the "local return" portion of sales tax revenues sent to cities (described further below) and on fares. On one hand, while the ridership and service data they voluntarily report to the NTD increases the amount of federal transit funds the region gets, they themselves cannot claim those funds. On the other hand, their operating expenses are much smaller than the Formula Allocation Procedure agencies, and their service areas often overlap with those bigger agencies. Four of the largest of these ineligible operators—Pasadena Transit, BurbankBus, Glendale Beeline, and the local circulators of the City of Los Angeles' bus system—negotiated with LA Metro in 2010 to receive an extra annual allocation of sales tax revenues. These "Tier 2 operators" still cannot claim federal funds themselves, but they at least have additional support given their place in the regional transit network (Michael Fajans and Associates, 2006; PVTA, 2021; Sparks, 2022; Pasadena Transit, 2019; LA Metro and City of Burbank, 2012; and Choi, 2012).

Because LA Metro allocated all three stimulus bills according to projected losses first in sales tax revenues and then in fares and other revenues, the county's smaller operators received less in stimulus funding, relative to their pre-pandemic expenses, than the county's larger operators and operators elsewhere in the region. **Figure 3** plots combined federal stimulus funded versus pre-pandemic operating expenses, on a logarithmic scale for ease of view. The small and Tier 2 operators in Los Angeles County stand out, with all but three receiving less than a third of their pre-pandemic operating costs in stimulus dollars (FTA, 2021b; LA Metro staffer, 2021; OCTA staffer, 2021; RCTC staffer, 2021; SBCTA staffer, 2021; VCTC staffer, 2021; and PVTA, 2021).

Led by the Pomona Valley Transportation Authority, some of these smaller operators in April 2020 wrote to LA Metro's CEO to ensure that the county's small operators would receive any CARES funds in the first place. Later, 43 of these agencies formed the Alliance of Local Transit Operators to lobby for greater funding. In October 2021, the Alliance requested LA Metro submit an application for a competitive, supplemental ARP grant on their behalf (PVTA, 2021 and Sparks, 2022).

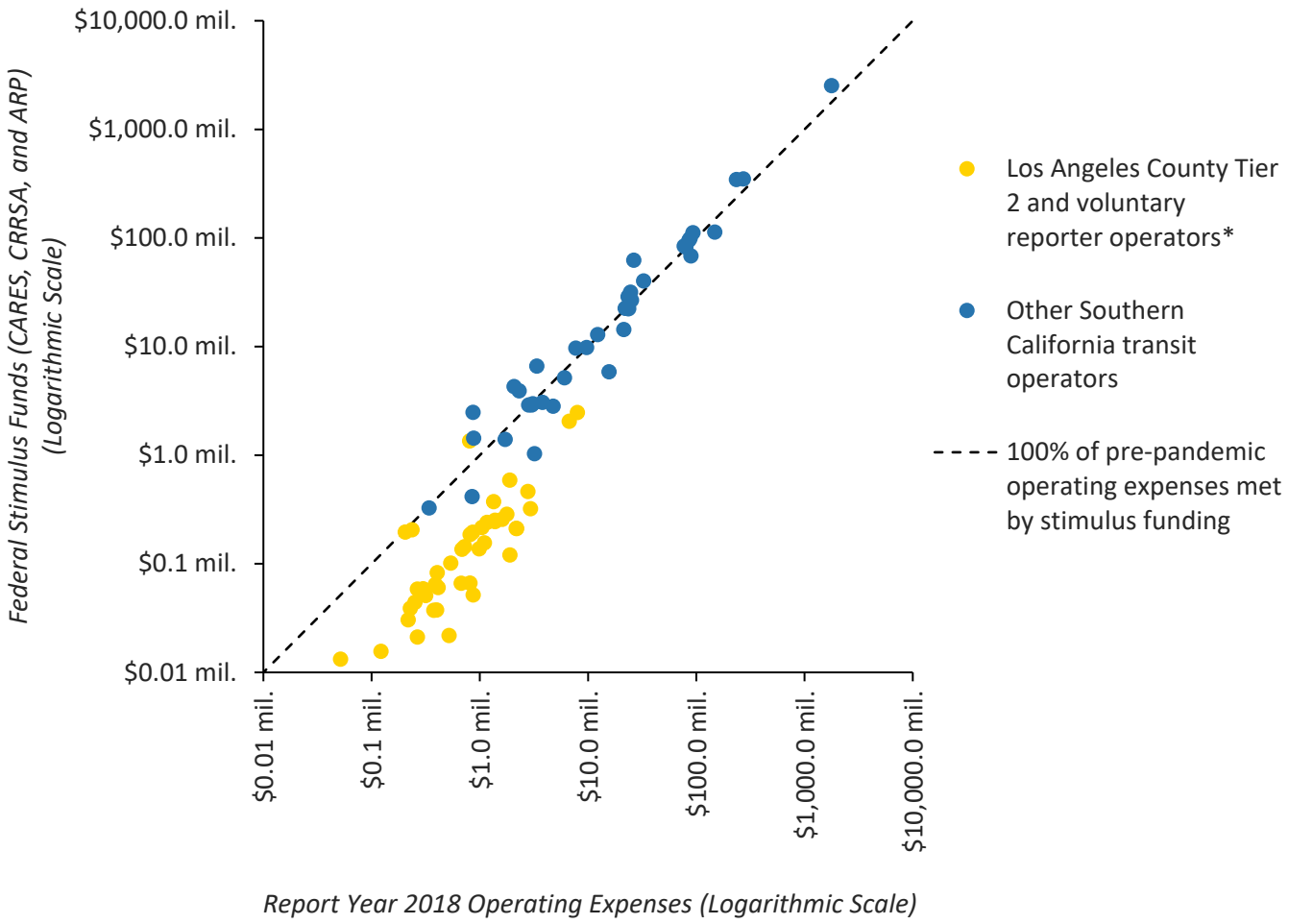
LA Metro staff and board reports, though, offer a few explanations for their funding allocations. For one, if LA Metro had followed other counties' lead and divided initial CARES funds among operators according to pre-pandemic federal formulas and eligibility criteria, then the county's small operators (that are not federal claimants) would not have been eligible for any stimulus funds at all. Furthermore, the basis of comparison matters. While **Figure 3** plots stimulus funds against pre-pandemic operating expenses, LA Metro judged allocations against projected and actual revenue losses. LA Metro's CARES allocation method actually gave small operators more relative to their projected sales tax losses than larger operators (As discussed in the next section, these losses turned out smaller than expected.) By that measure, LA Metro not only used the stimulus to fill any holes in what they would have ordinarily provided to the small operators but gave them further relief funds on top of that. LA Metro also made an exception to an adopted, pre-pandemic cap on these small operators receiving more than a quarter of their operating costs in subsidy. Finally, staff noted the messiness that would have occurred had LA

---

[10]. Including two newer agencies that took over lines and parts of service areas from those legacy operators

[11]. The first of which passed in 1980

Figure 3. Pre-pandemic Operating Expenses versus Combined Federal Stimulus Funding



** Includes other special project operators; excludes operator only partially in the Tier 2 category*

Data sources: FTA, 2021b; LA Metro staffer, 2021; OCTA staffer, 2021; RCTC staffer, 2021; SBCTA staffer, 2021; and VCTC staffer, 2021

Metro switched allocation methods between CARES and the latter two stimulus bills (LA Metro staffer, 2021 and LA Metro, 2020c).

The difference in perspective, then, rests on the structure of transit funding in Los Angeles County—in which LA Metro, for various historical reasons, is both an operator and a CTC and which there are far more small transit operators than in other counties. Because of this pre-existing structure, political negotiations during the pandemic, and decisions made without the benefit of hindsight, smaller agencies in the county received more in stimulus funds than they ordinarily would have from a federal funding package but less than peers in other counties.

Despite these unique circumstances of small Los Angeles County operators vis-à-vis the federal relief funding shown in **Figure 3**, overall there was a strong correlation across the region between total stimulus funds and pre-pandemic operating expenses (r = 0.999)—as expected given the design of stimulus allocations in most counties.

We did not find substantial correlations between stimulus dollars received and pandemic changes in ridership (measured as change between October 2019 and October 2020) (r = 0.192) nor between share of pre-pandemic expenses covered by the stimulus and pandemic changes in ridership (r = 0.141). This means that, despite all of the nuances of allocation decisions, the Southern California agencies that lost the greatest share of their ridership, and presumably fare revenues, were no more or less likely to receive more in stimulus support (FTA, 2021b; LA Metro staffer, 2021; OCTA staffer, 2021; RCTC staffer, 2021; SBCTA staffer, 2021; and VCTC staffer, 2021).

Local Option Sales Tax Revenues

Even as the federal government threw transit agencies three substantial fiscal lifelines, it turned out that Southern California operators were doing better staying afloat with local tax subsidy support than most observers had anticipated. Specifically, dedicated sales tax revenues that support transportation projects and operations in the region remained healthy, after a deep, albeit brief drop at the start of the pandemic. With the broader economy and spending patterns recovering from the pandemic shock relatively quickly—due at least in part to federal pandemic relief funds going directly to households as well—both in-person and online sales subject to taxes bounced back and transit agencies were again able to rely on this resilient revenue stream.

Local option sales taxes for transportation are incremental increases in a county's sales tax (typically an additional ¼ to one cent per dollar), with the incremental increase in revenues earmarked for transportation projects, operations, and maintenance. LOSTs fund both capital projects and operations and support not just public transit but roads, freeways, bicycle and pedestrian projects, and more. In California, LOSTs must be approved by a supermajority of voters, either for a set period or, like Los Angeles County's four measures, indefinitely. Every county in the region but Ventura has enacted a LOST; in Los Angeles County, voters approved four separate ½ cent LOSTs, in 1980, 1990, 2008, and 2016 (King et al., 2021, forthcoming; Fraade and Speroni, 2019; CDTFA, 2022; Crabbe et al., 2005; and Lederman et al., 2021).

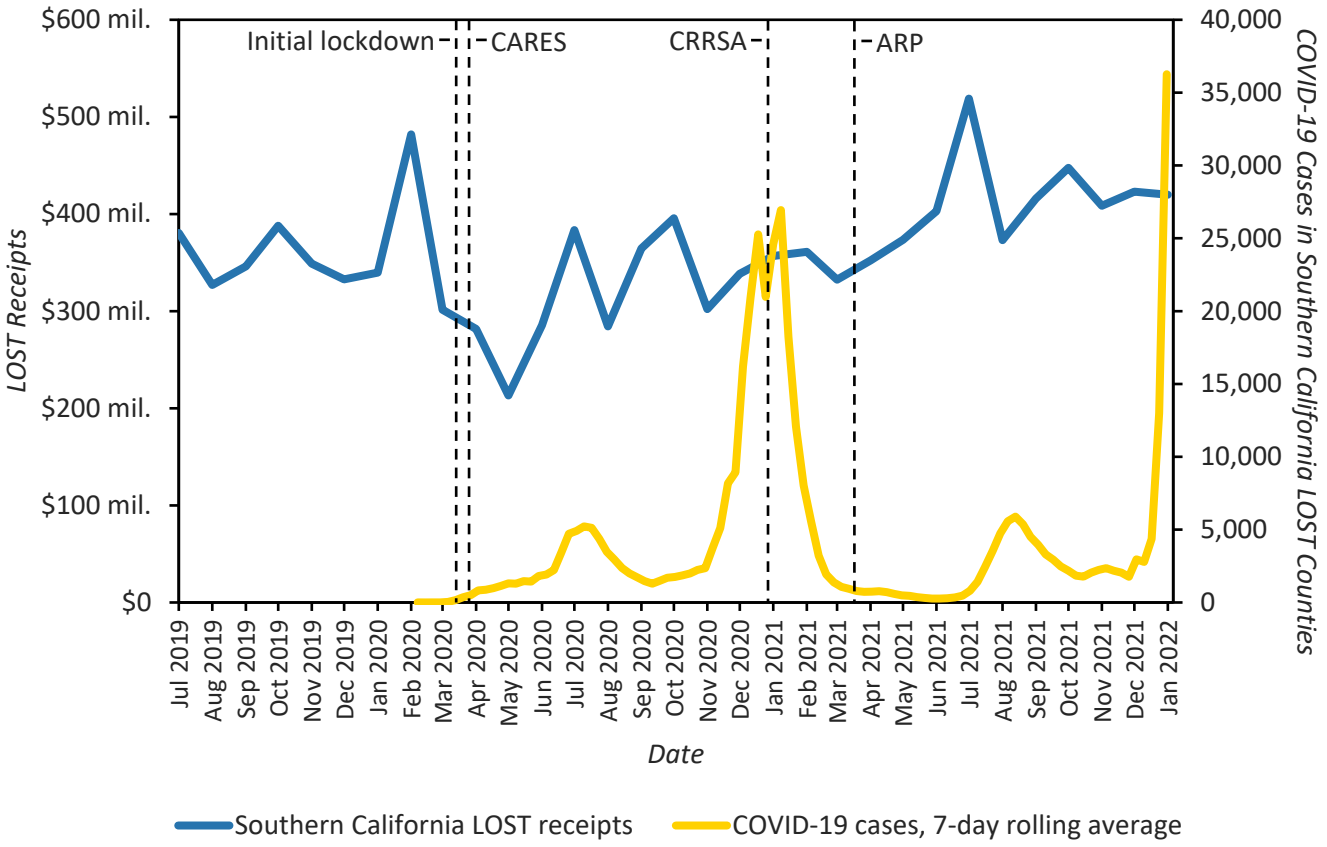
LOSTs have grown in importance as pre-pandemic federal support for transportation declined, in relative terms, throughout the 20th and 21st centuries. Most pre-pandemic federal dollars for local surface transportation came from motor fuel taxes, which are usually levied as a fixed amount per gallon of vehicle fuel sold. But as road maintenance costs crept up and vehicles' fuel efficiency improved, the buying power of federal fuel taxes fell relative to miles of vehicle travel and outstanding maintenance needs. Federal gasoline and diesel taxes are not indexed to inflation, and Congress last raised their rates in 1991. To plug this gap, local governments like Southern California counties have turned to their own, internally generated revenue sources, of which LOSTs are the most popular, politically palatable, and lucrative (King et al., 2021, forthcoming; Hess and Lombardi, 2005; Lederman et al., 2018; and Wachs, 2009).

LOSTs tend to fund a set of programs and projects according to timelines and priority rankings often laid out in their ballot measures. Often, a share of LOST revenues go towards "local return" to cities within a county, to spend on local transportation expenses (like municipal transit services). While some LOSTs include provisions for adjusting these distributions, their designs balance flexibility and accountability to varying degrees. LOST ballot propositions typically included forecasts of revenues, with ranked lists of projects to be funded contingent upon the degree to which those forecasts are realized. Lower-ranked LOST projects can be delayed or canceled when actual revenues fall below predicted receipts (King et al., 2021, forthcoming; Goldman and Wachs, 2003; Wachs et al., 2020; and Lederman et al., 2021).

LOSTs thus tie transportation funding to the supply of and demand for taxable goods and services—and, thereby, to macroeconomic trends. For this reason, the initially grim economic circumstances at the start of the pandemic

prompted pessimistic forecasts for a deep and possibly prolonged economic recession characterized by depressed consumer spending, with foreboding implications for transit agencies' finances. From the onset of the pandemic into the second and third quarters of 2020, uncertainty about both public health and the economy was at its highest, and many analysts produced dire near-term predictions of depressed tax revenues (King et al., 2021, forthcoming; Dadayan, 2020; and LA Metro, 2020c). Transit agency interviewees also recalled fearing huge sales tax losses, requiring significant cuts to service and payrolls. A staffer at one operator in San Bernardino County recalled anticipating catastrophic sales tax losses of at least half, potentially up to three quarters pre-pandemic levels. At LA Metro, the region's largest collector of LOST revenues, staff in May 2020 projected sales tax declines of 17 to 22 percent over the following 18 months, compared to pre-pandemic trends, with a worst-case scenario single-quarter loss of around 40 percent in the spring of 2020 (LA Metro, 2020c). LA Metro did end up averting cuts early on, but staff still fretted over both a lack of liquidity due to sluggish sales tax receipts and the effects of potential tax amnesty plans being discussed at the state level.

Figure 4. LOST Receipts and COVID-19 Case Rates in Southern California LOST Counties



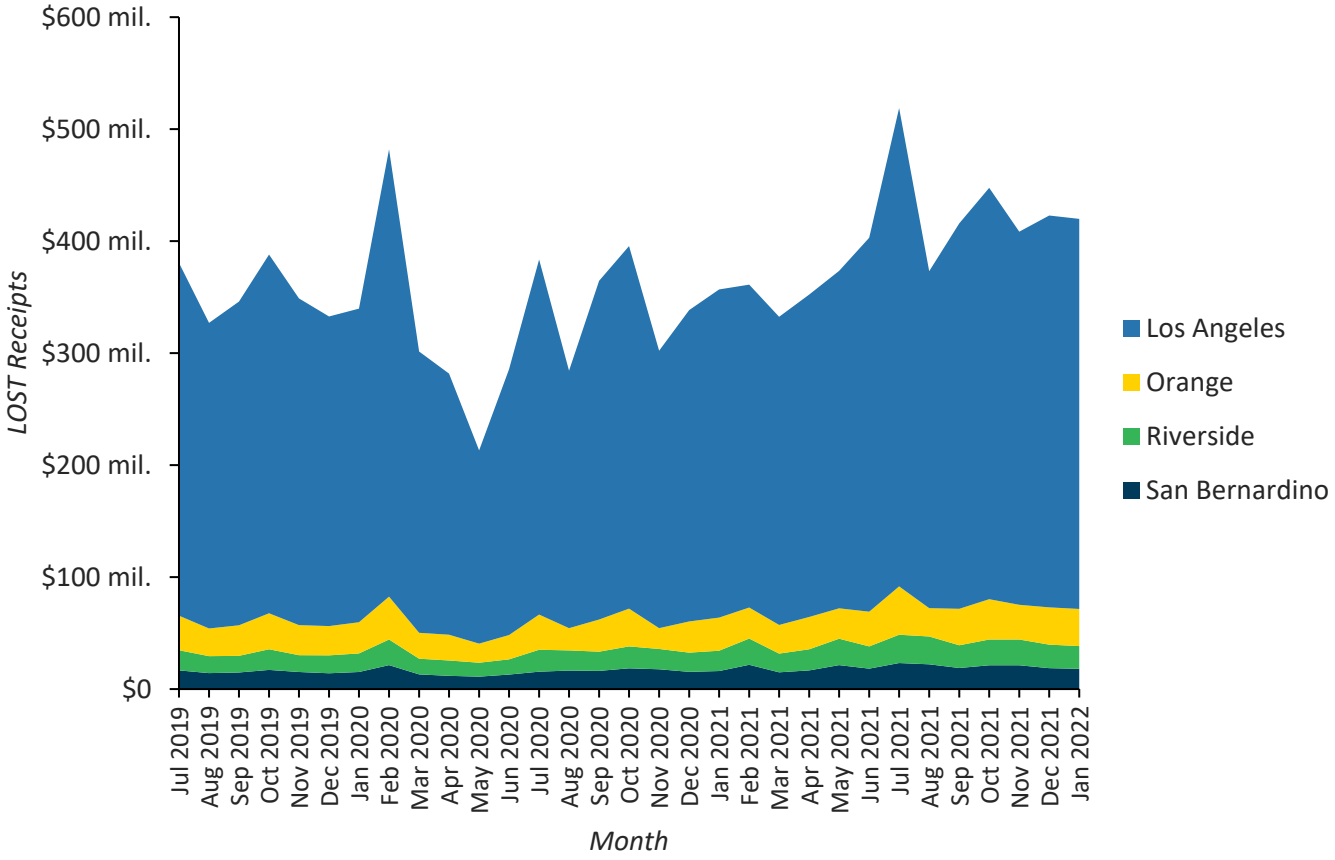
Data sources: CDTFA, 2022; California Health and Human Services, 2022; FTA, 2021c, 2021g; USDOT, 2021; and Cowan, 2021

LOSTs, however, proved remarkably resilient. While revenues did decline sharply at first, the worst-case scenarios decidedly did not come to pass. We examined tax receipt data from the California Department of Tax and Fee Administration (CDTFA), which collects sales taxes and returns appropriate shares to counties and

special districts a few months after collection. **Figure 4** plots sales tax receipts in the four Southern California counties with LOSTs, along with COVID-19 case rates in those counties. Collectively, these counties accounted for almost two-thirds of the state's total LOST receipts, both before and during the pandemic. In March 2020, LOST receipts in the region did drop ten percent compared to January 2020—and a much larger 37 percent compared to an exceptionally high total of $482 million in February 2020, in the lead-up to the global "safer-at-home" orders the next month. As COVID-19 cases rose and state-imposed public health orders closed businesses and reigned in travel, tax receipts fell dramatically, bottoming out in May at $213 million—which was 38 percent lower than January and a whopping 57 percent below February. But then, as public health regulations eased over the summer of 2020, LOST receipts rebounded remarkably, reaching January 2020 levels by July 2020 (CDTFA, 2022; California Health and Human Services, 2022; and Cowan, 2021).

For the next eight months, LOST revenues remained healthy, fluctuating somewhat but with no discernible correlation with case rates (See **Figure 4**). They have varied moderately from month to month across Southern California counties after the nadir in May of 2020 through January of 2022 but are generally on an upward

Figure 5. LOST Receipts by County in Southern California



Data source: CDTFA, 2022

trajectory. Even amidst dramatic increases in COVID-19 case rates during both the winters of 2020-21 and 2021-22, Southern California LOST revenues have remained robust, probably due in part to holiday shopping. Notably, when vaccinations became widely available in the spring and summer of 2021, case rates dropped to new lows, and the state fully "reopened" and rescinded most public health restrictions, regional monthly LOST receipts hit a two-year high of $519 million in July 2021. Since then, through the coming of the Delta and Omicron variants, LOST revenues have remained near or above $400 million monthly, higher on average than the six months before the pandemic (CDTFA, 2022; California Health and Human Services, 2022; and Cowan, 2021).

We marked the three federal stimulus bills in **Figure 4** not to note the direct funding for transit operators discussed above but because of the payments to individuals and families and business support in each of the bills.[12] While we do not have the data to model the effects of these programs on consumer spending and tax revenues, surveys and reports suggest stimulus payments did boost spending, especially among lower-income households (though Americans used a greater share of their stimulus checks for debt reduction and for savings than for spending) (Armantier et al., 2021; Mutikani, 2021; FTA, 2021c, 2021g; and USDOT, 2021). This in turn may have contributed directly to increased sales tax revenues for transit.

Within the region, Los Angeles County accounts for most of the volatility in absolute LOST revenues (See **Figure 5**). Los Angeles County not only is the largest and most economically powerful of the four counties, its four transportation LOSTs combined account for over half of the state's LOST dollars. This huge total may have helped make up for the disparities across counties in stimulus funds by operator noted in **Table 4**. But in relative terms, all four of the region's counties with LOSTs experienced average revenue trends comparable to the rest of the state. **Figure 6** plots the change in LOST receipts by county from the same month in 2019, with the range and unweighted average for all counties in the state (CDTFA, 2022). In general, across California, less urban counties, lower-income counties, and counties with a lower share of workers in sectors like technology and professional services had better-performing LOSTs than more urban, high-income, and low-tech-employment counties (King et al., 2021, forthcoming). In Southern California, Los Angeles and Orange Counties remained at or below the state average of relative LOST performance for most of the pandemic, while Riverside and San Bernardino Counties were slightly above average (CDTFA, 2022).

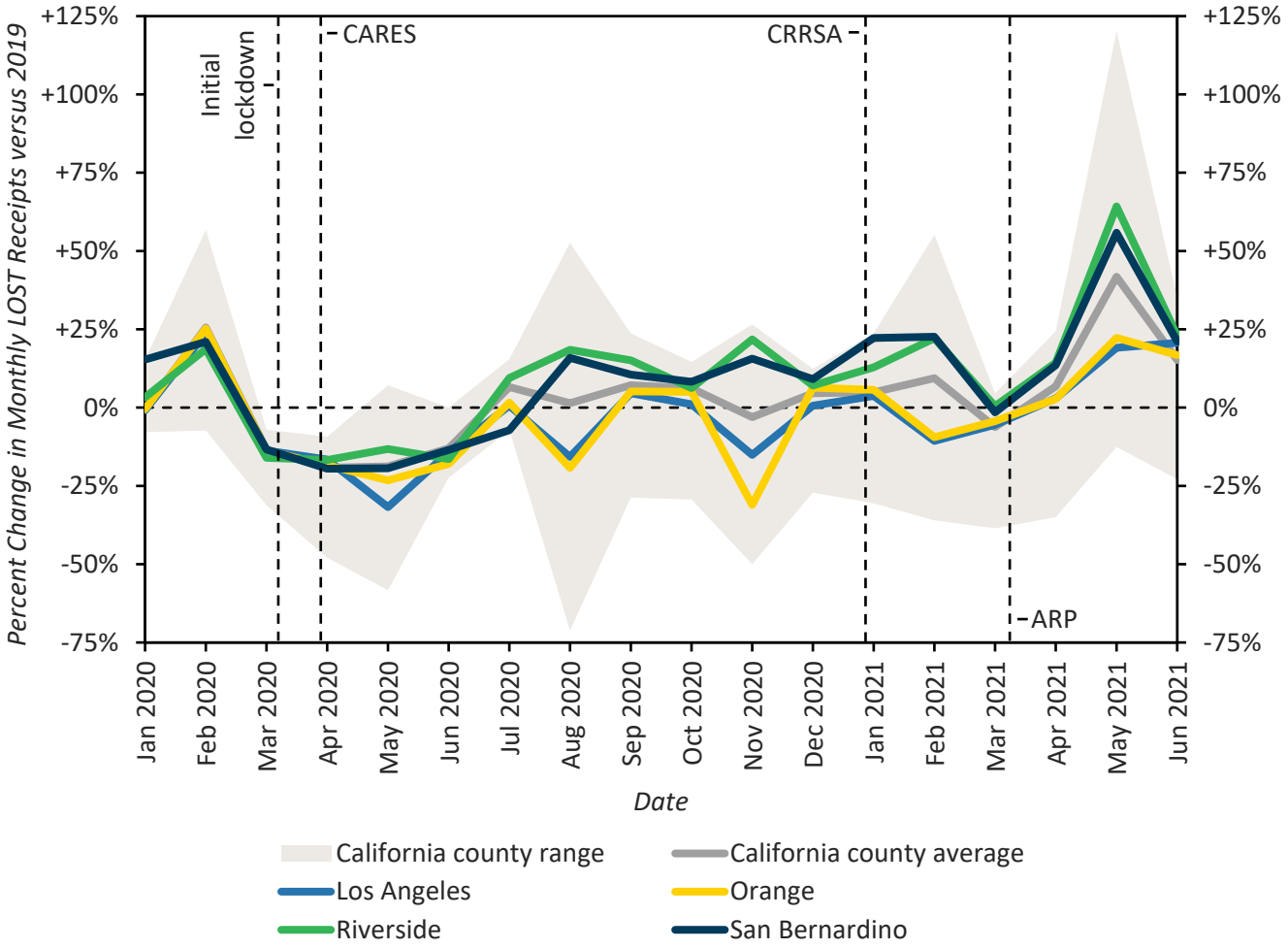
As noted above, of the five Southern California counties, only Ventura lacks a local option sales tax for transportation. According to one of our interviewees from Ventura County, this has kept service frequencies lower than in comparable areas in other counties even before the pandemic and put more of a strain on the operator during the pandemic.

While LOST revenues did recover more quickly than many anticipated, transit operators did not immediately receive the fruits of this unexpected LOST bounty. In Los Angeles County, LA Metro, in its role as the CTC, anticipated large sales tax losses and drew up a conservative allocation plan for LOST funds early in the pandemic. As county LOST revenues eventually turned out higher than predicted, LA County operators will eventually receive those extra dollars, but on a one- or two-year lag due to this conservative allocation plan.

---

[12]. Though stimulus payments took time after the passage of each bill to be disbursed

Figure 6. Changes in LOST Receipts Compared to the Same Month in 2019



Data sources: CDTFA, 2022; FTA, 2021c, 2021g; USDOT, 2021; and Cowan, 2021

Overall Budget Effects

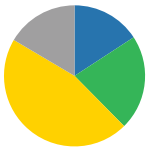
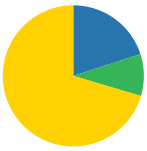
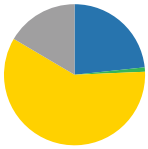
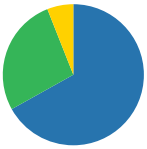
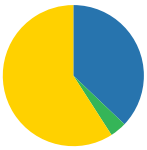
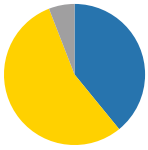
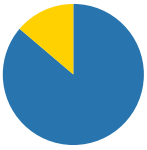
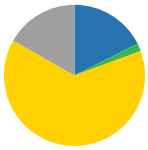
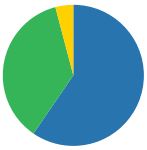
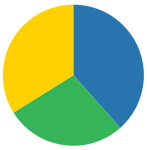
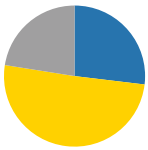
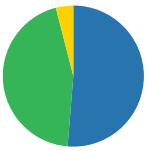
Operator Budgets

Both rising costs and decreased fare revenues significantly affected transit agency budgets—but so too did new revenues like the federal stimulus and existing revenue streams that remained strong, as discussed above. We next consider how all of these various effects to both revenue sources and expenditures have combined in transit agency budgets during the pandemic.

The budgets of Southern California transit operators vary widely in both size and sources and amounts of income and subsidies. **Table 5** provides a breakdown of the fund sources for pre-pandemic operating and capital budgets at the seven agencies from which we obtained detailed budget documents and conducted informational interviews in summer 2021. The charts split revenues into transfers from the federal government, transfers from state

government, transfers from local governments, and directly generated income (fares, advertising revenue, etc.). **Table 5** shows that the seven agencies differ markedly. While local dollars tend to constitute the largest share of operating funds and federal dollars contribute most to capital funding, there is noticeable variation in pre-pandemic finances even among operators of roughly the same size, especially on the capital side. Not

Table 5. Pre-pandemic Expenditures by a Sample of Seven Southern California Transit Agencies

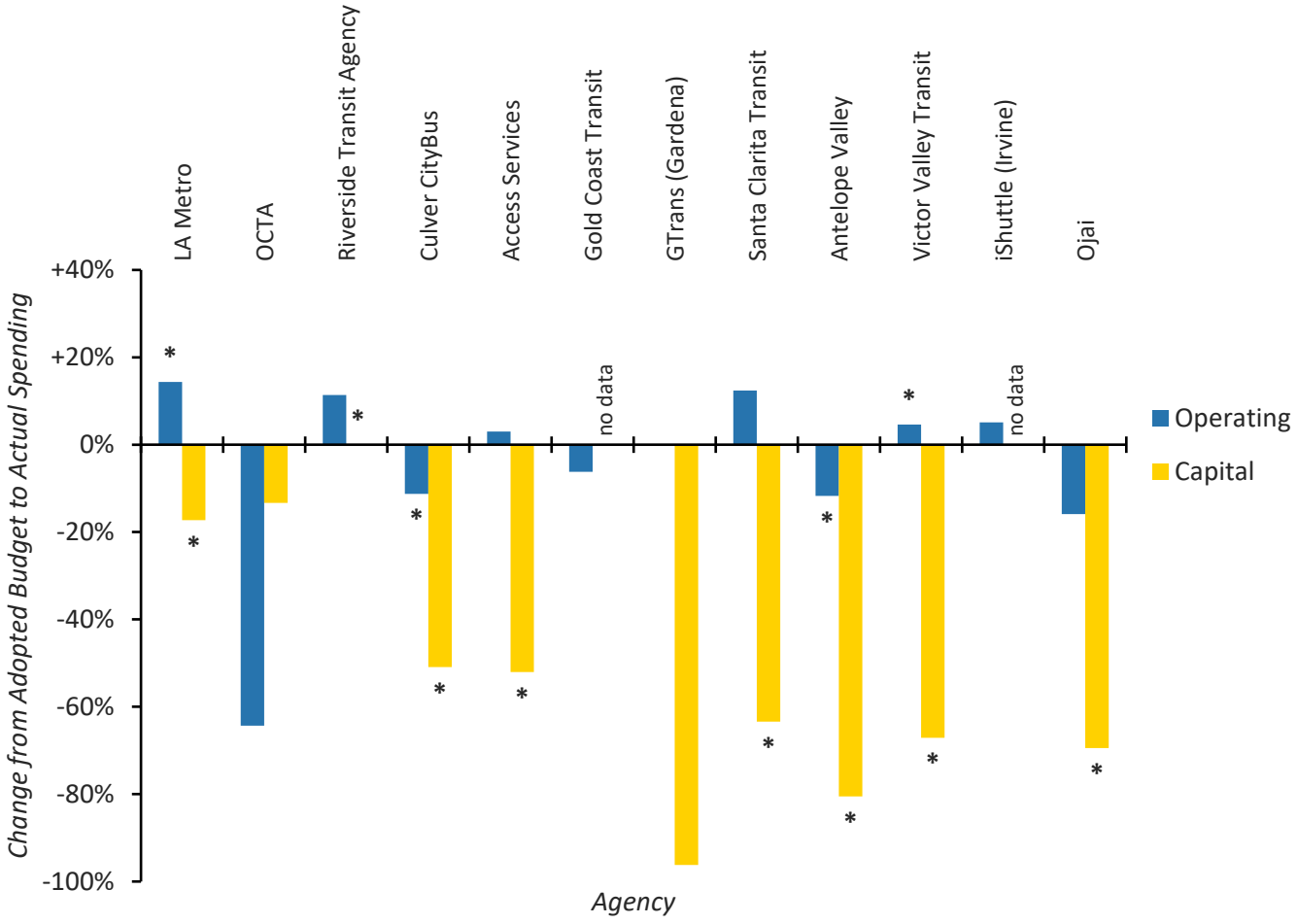
Agency	FY 2019 Boardings	FY 2019 Operating Expenditures		FY 2019 Capital Expenditures	
LA Metro	380 mil.	$2,021 mil.		$1,670 mil.	
Riverside Transit Agency	8.7 mil.	$85 mil.		$22 mil.	
Culver CityBus	4.6 mil.	$24 mil.		$0.9 mil.	
Access Services	4.5 mil.	$172 mil.		$5.8 mil.	
Gold Coast Transit	3.6 mil.	$25 mil.		$1.7 mil.	
GTrans (Gardena)	2.9 mil.	$23 mil.		$1.0 mil.	
Antelope Valley	2.4 mil.	$25 mil.		$15 mil.	

Data source: FTA, 2021b

surprisingly, LA Metro stands out by funding much of its capital program through local sales tax revenues (FTA, 2021b).

Among the seven transit operators we examined in depth, we found that those with a greater share of pre-pandemic federal support tended to be smaller agencies that serve areas farther from urban cores and, often, that serve specific groups of riders like university students. These agencies had larger relative fluctuations in their annual expenditures (again, especially their capital expenditures) in the years leading up to the pandemic. During the pandemic, many substantially reduced their service, often on major commuter-oriented routes. However, we cannot attribute these trends to their reliance on federal funding so much as their size, service area, and other factors. Indeed, we could find no obvious relationships between agencies' pre-pandemic fund sources and their financial or operational performance during the pandemic.

Figure 7. Difference between Adopted Budgets and Actual Spending, Fiscal Year 2019



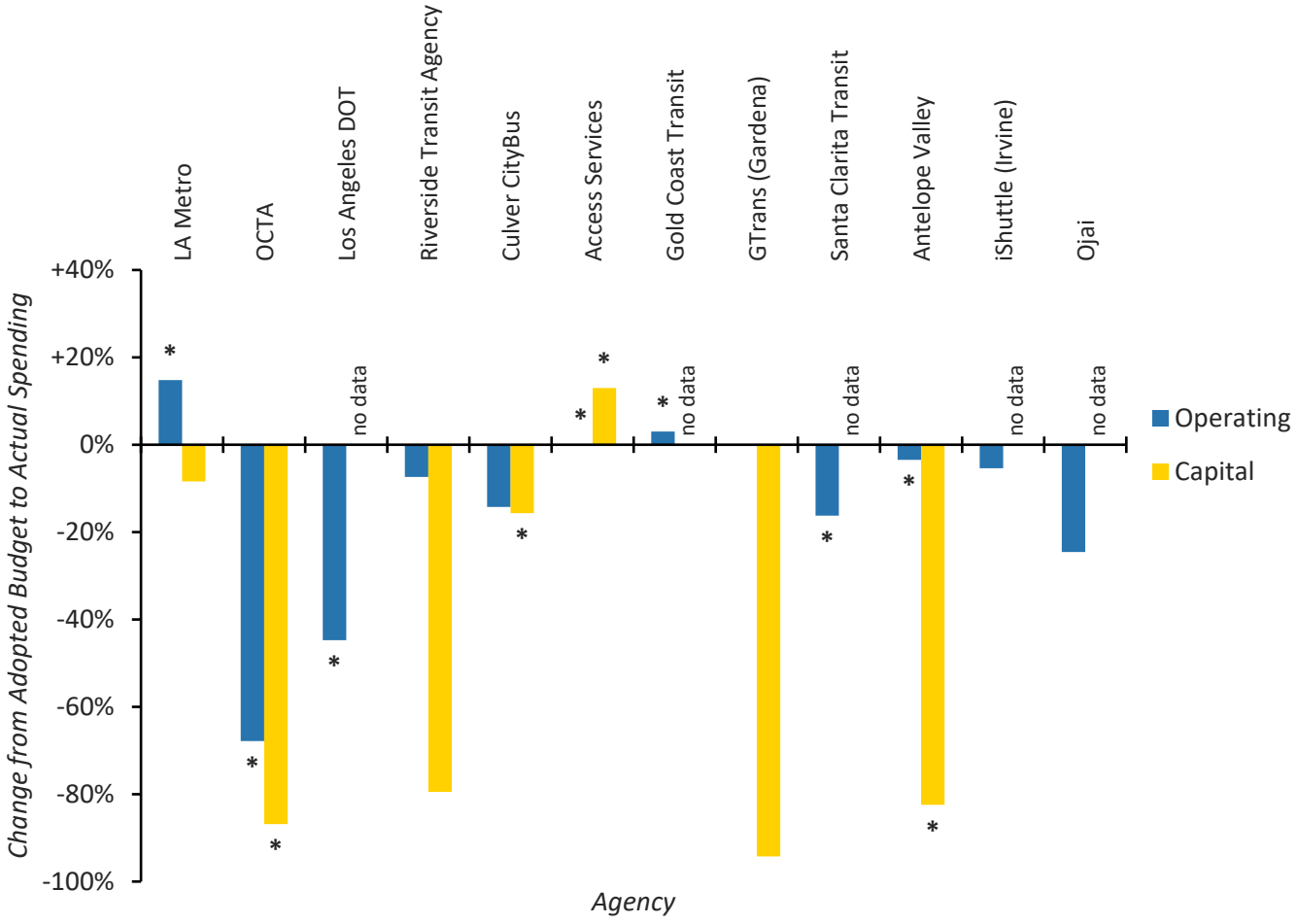
Bars represent FY 2019 agency adopted budget versus FY 2019 agency audited budget, except:
** FY 2019 agency adopted budget versus FY 2019 NTD operating or capital expenses*

Data sources: operator budgets and FTA, 2021b

As discussed in previous sections of this report, the pandemic affected both revenue sources and expenditures. To consider fluctuations in the overall size of agency budgets, we compared initially adopted budgets at the start of the year with audited budgets after the fiscal year's end for agencies from which we were able to obtain both. For other operators, marked with asterisks in **Figures 7** and **8**, we compared adopted budgets to NTD expenses reported after the fiscal year's end.

Before the pandemic, Southern California transit agencies' initial operating budgets corresponded fairly well with the actual funds spent that year. In Fiscal Year 2019, the last full fiscal year before the COVID-19 pandemic, operating spending was typically slightly more than budgeted, but the majority of agencies had expenditures within 15 percent of their approved budget (See **Figure 7**). On the capital side, agencies generally ended up spending substantially less than budgeted. Because many years can pass between large, one-time projects, capital expenditures at a given transit agency will vary more from year to year than operating costs, which tend to

Figure 8. Difference between Adopted Budgets and Actual Spending, Fiscal Year 2020



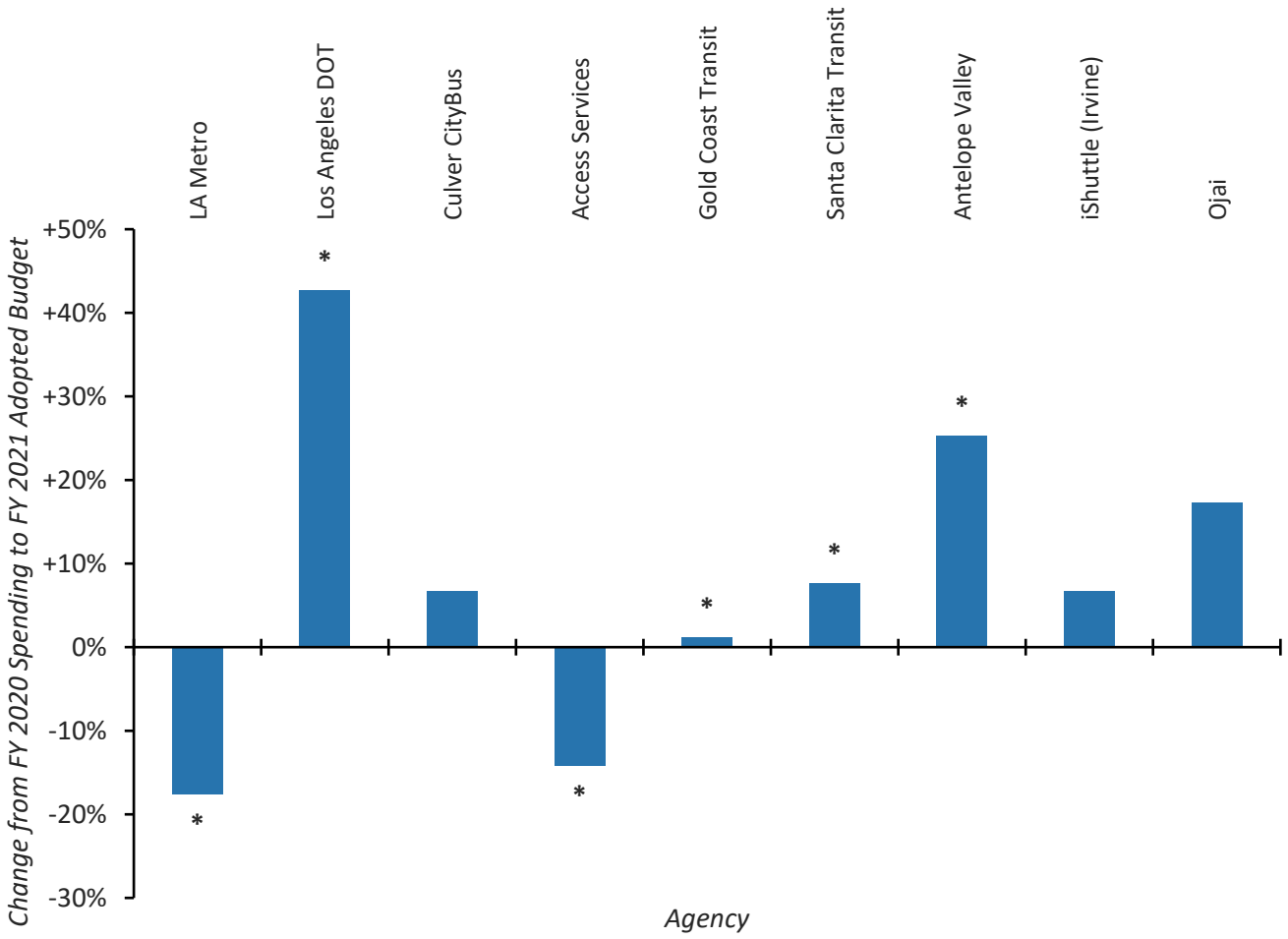
Bars represent FY 2020 agency adopted budget versus FY 2020 agency audited budget, except:
** FY 2020 agency adopted budget versus FY 2020 NTD operating or capital expenses*

Data sources: operator budgets and FTA, 2021b

be more stable over time. The differences we found on the capital side in Fiscal Year 2019 were likely because project delays, common in capital projects, shift budgeted expenditures into succeeding years. In addition, there appear to be differences in the way agencies classify capital projects in their own budgets versus how they report expenditures on these projects to the NTD.

Fiscal Year 2020 looked much different than FY 2019, given that the pandemic struck in the last third of the year. Overwhelmingly, and perhaps unintuitively, agencies from which we obtained budgets spent substantially *less* in both capital and operating expenses than they had initially budgeted (See **Figure 8**). This is because many agencies cut their service in response to falling demand and/or inadequate labor, even as expenditures on vehicle sanitation rose. Most systems sought to spend their funds conservatively—at least during the first months of the

Figure 9. Difference between FY 2020 Actual Operating Spending and FY 2021 Adopted Operating Budgets



Bars represent FY 2020 agency audited operating budget versus FY 2021 adopted operating budget, except:
** FY 2020 NTD operating expenses versus FY 2021 agency adopted operating budget*

Data sources: operator budgets and FTA, 2021b

pandemic during FY 2020, when only one stimulus bill had passed and tax revenue forecasts were universally gloomy.[13]

This pattern of falling FY 2020 expenditures was especially pronounced for capital expenditures; some agencies paused large-scale capital spending, at least initially, due to sharp declines in ridership and uncertainty about the future. Access Services, the one agency that spent more than planned on capital costs, could do so because of its unique funding guarantee (discussed below) as a federally-mandated paratransit provider.

While audited Fiscal Year 2021 budgets and NTD Report Year 2021 expenses were not available during the conduct of our research, we were able to compare actual operating expenses in FY 2020 to planned operating expenses in FY 2021. In their FY 2021 adopted budgets, most agencies we examined planned to spend more in FY 2021 than they actually did in FY 2020 (See **Figure 9**). During FY 2021, agencies both anticipated and did restore service and reinstate fare collection, and two more federal stimulus bills passed as well. In the second half of the fiscal year (January through June 2021), ridership began to gradually recover from its early-pandemic lows (See **Figure 2**). However, we do not yet know whether actual spending in FY 2021 matched these budgetary intentions. At LA Metro, for example, revenues by January 2021 came in far higher than expected (Linton, 2021a), and a mid-year budget amendment (not reflected in **Figure 9**) raised both budgeted and actual expenditures (Linton, 2021b).

Funding Agreements and Backstops

The pandemic also revealed the importance of funding agreements among transit operators and local jurisdictions, which served as a budgetary backstop for a few recipient agencies. These agreements take a variety of forms, but all involve a guarantee that one unit of government will fund another. These provided crucial financial security for recipient operators, thereby shifting, but not eliminating, funding burdens.

Access Services, which provides paratransit service throughout Los Angeles County, is a prime example. Under the Americans with Disabilities Act, transit agencies are required to provide paratransit service for travelers with disabilities that prevent them from using available fixed-route transit service. In much of the U.S., each transit agency is responsible for both fixed-route and paratransit service in their service area. With respect to the latter, the agency may supply the service directly, contract with a (usually) private provider to operate their paratransit service under the contracting agency's branding, or contract with another public agency to provide their paratransit under a separate brand. Los Angeles County, however, is unique in having a single, independent, consolidated public agency, Access Services, that provides paratransit service on behalf of all fixed-route transit operators in the county. LA Metro (in its capacity as the Los Angeles CTC) funds Access Services for doing so.

According to our interviews with Access Services staff, Access Services requests funds from LA Metro for the year based on the number of rides it expects to offer, with any unused funds (due to fewer than budgeted rides carried) returned at the end of the year. LA Metro has considerable latitude in determining which funding sources it uses to fund Access Services. To some degree, the specifics of this annual funding request are subject to negotiation: just before the pandemic, Access Services staff had worried that their ridership would exceed their funding for the fiscal year and that they would need to go back to LA Metro to ask for a supplementary allocation. Ultimately, though, providing—and thus funding—paratransit is a federal civil rights requirement. For this reason,

---

[13]. Our earlier presentation of data showing costs rising were unit cost measures—cost per service hour and per boarding—while these data are on total cost irrespective of service or ridership.

after the pandemic struck, Access Services staff had less concern about funding their service than did representatives from any of the other transit operators we interviewed. While Access Services staff indicated that the availability of stimulus funds made their discussions with LA Metro much easier, the onus to fund Los Angeles County paratransit services ultimately lies with LA Metro.

A similar funding guarantee dynamic pertains to Metrolink, the region's commuter rail operator.[14] Formally the Southern California Regional Rail Authority, Metrolink is a joint powers authority governed and funded by the five Southern California county transportation commissions. Metrolink operates on a zero-based budget, projecting fare revenues and expenses each year and then filling the balance through CTC subsidies, according to memoranda of understanding with each of the five CTCs. Before the pandemic, the agency had among the highest farebox recovery ratios of any operator in the region (Metrolink, 2016), which kept a lid on the required subsidies. The pandemic, though, nearly zeroed out fare revenues on Metrolink. Again, though, our interviewee at Metrolink expressed that the agency was less worried about funding their operations than might be expected, because of the funding guarantee agreements they have in place with their member counties. These funding commitments are not as ironclad as Access Services' federally mandated paratransit service—and indeed, if the stimulus bills had not passed, both Metrolink and LA Metro staff told us that Metrolink would have had to make "quite draconian" cuts to service (beyond the 30% cut Metrolink did do) (LA Metro staffer, 2021). But with the federal stimulus funds, the CTCs were able to contribute their shares of Metrolink funding and make up for Metrolink's significant fare revenue losses.

Staff at LA Metro stressed that they never picked winners and losers by prioritizing funding one operator over another in their capacity as the Los Angeles CTC. Such hard choices have largely been avoided during the pandemic because federal stimulus funding and other stable revenue sources meant that worst-case scenario exercises remained as exercises. Indeed, LA Metro and the other counties' CTCs have formalized relationships with every operator they fund, in various forms. Yet from our interviews, the unique backstopped structures of Access Services and Metrolink did at least provide staff there an extra measure of stability and security during the pandemic.

Those agencies with fewer funding sources and without the backstops enjoyed by Access Services and Metrolink faced more fiscal constraints. Foothill Transit, for one, is a regional bus system operating primarily in the San Gabriel Valley under a joint powers authority among 22 cities and Los Angeles County (Foothill Transit, 2022). However, Foothill receives no direct subsidy funding from any of these member municipalities (Foothill Transit, 2021). While it receives formula funds from LA County's sales taxes, Foothill does not receive "local return" funds—the portion of sales tax revenues given to cities to fund their own transportation needs. Thus, unlike municipal transit operators, like Long Beach Transit and Santa Monica Big Blue Bus, that could draw on their city's local return funds or operators like Access Services and Metrolink with intergovernmental funding guarantees, Foothill Transit had fewer and less secure funding sources with which to weather the pandemic.

---

[14]. "Commuter rail" refers to local passenger railroad service, which typically operates from neighboring metropolitan areas or the exurbs of a large metropolitan area to the downtown of that large metropolitan area. Most commuter rail service carries workers relatively long distances (about 25 miles on average) into downtowns on weekday mornings, and outbound to far-flung suburbs or neighboring metropolitan areas in the afternoon. Because most commuter rail users are downtown commuters, and because downtown office employment fell early in the pandemic and has only partially recovered, commuter rail ridership has fallen especially far during the pandemic (FTA, 2021b; McArdle, 2022; Descant, 2021; Haag and McGeehan, 2022; and Ionescu, 2022).

Responses to the Pandemic and Their Financial Implications

This section considers how the COVID-19 pandemic and shifting transit system finances resulting from the public health crisis affected public transit in Southern California. We first examine transit service changes and the degree to which finances did, and did, not affect them. We then turn to examples of two smaller agencies most affected by the pandemic, and how they managed these changes. Third, we examine how the pandemic affected the transit workforce early on, and how systems variably managed workforce impacts. And finally, we discuss how little the pandemic affected capital planning at most agencies.

Service Changes

Among the first responses to the pandemic by many transit systems was to cut service. While ridership dropped far more than service early on, these cuts eliminated some routes and reduced service frequency on many others. As a result, in spite of plunging demand, some transit vehicles remained more crowded than recommended by public health social distancing guidelines at the time. A number of agencies dropped weekday service in favor of their pre-established weekend service plans. For example, the Antelope Valley Transit Authority operated close to its Saturday service plan and LA Metro its Sunday plan in the spring of 2020. Metrolink cut train service to 70 percent of normal.

Southern California transit agencies employed a number of strategies to maximize service while reducing the financial effects of operating it. Foothill Transit focused its cuts on their commuter routes, on which ridership dropped most (and has hardly recovered since), but made few service cuts to its local routes, where ridership was both steadier and faster to revive. In San Bernardino County, Omnitrans was already on the verge of implementing a downsized service plan when the pandemic began. The system has been losing riders for several years leading up to pandemic, which increasingly threatened Omnitrans' financial outlook. During the pandemic, then, Omnitrans made no cuts to system service levels beyond those already planned. Both examples reflect a trend from the Great Recession, when many agencies that cut service also used the opportunity to reallocate it towards better-performing routes (Manville, Taylor, and Blumenberg, 2018). Access Services actually increased some aspects of service quality during the pandemic: allowing requests for rides to be made the same day, as opposed to a day prior, and carrying only a single passenger per vehicle at a time through April 2021. Access Services also pivoted to delivering around half a million meals and groceries, in partnership with the City of Los Angeles and area nonprofits, for which staff hopes to eventually receive reimbursement from the Federal Emergency Management Agency (FEMA).

Agencies reduced service more in response to falling demand, limited driver availability, and *anticipated* revenue losses than to actual shortfalls. As the second and third stimulus bills passed and transit operators' financial situations became both clearer and rosier, most systems began to restore service. All operator staff we interviewed in summer 2021 noted that their service levels were then increasing or had been increasing, as more federal money became available and boardings continued to rebound. Those interviewed at the time expected service levels to return to pre-pandemic levels by the end of summer 2021, though other issues like the labor shortages (discussed below) have since forced some service retrenchment. Overwhelmingly, agencies employed

a proactive approach to service planning, restoring service in advance of returning ridership and relying on predictions of near-term demand changes to inform service allocations.

Averting the Worst Service Outcomes

At the start of the pandemic and at a few points later in 2020, some in the transit industry offered dire predictions of bankruptcies or transit systems permanently closing. While a cynic might view such predictions as histrionics to help lobby for additional federal financial support, the level of 2020 revenue losses from traditional sources did indeed paint a dire fiscal picture absent federal relief funds. Further, even with the generous federal support discussed above, a few Southern California systems did take fairly drastic measures to cut costs, especially early on in the pandemic. Nonetheless, federal relief, increased funding flexibility, and nimble planning made the most drastic service cuts only temporary.

Consider the example of the Anaheim Transportation Network (ATN), a unique nonprofit corporation that runs Anaheim Resort Transportation, which connects the Disneyland Resort, major hotels, Angel Stadium, and other area attractions, as well as the Free Rides Around the Neighborhood microtransit service in downtown Anaheim. With the amusement parks, baseball stadium, and hotels all closed or almost completely empty in the early stages of the pandemic, ATN stopped running most of its major routes, save for a few trunk and commuter routes for local travelers, often operating on an on-demand basis. ATN's funding structure was unfortunately quite poorly suited for the pandemic: 85 percent of pre-pandemic operating expenses came from fare revenues, supplemented by assessments on venues, hotels, etc. in certain special districts. With almost no riders, the former source fell to zero as ATN suspended fare collection for the few remaining patrons, and ATN paused the assessments as well, with their board fearing that the businesses would not be able to pay. ATN laid off some staff, furloughed others, and had others rely on drawing down their accrued time off; some capital project work was also slowed. Only with the Disneyland Resort's April 2021 reopening did ATN, in coordination with the city, resorts, and tourism boards, restart its resort-serving routes, with fare collection resuming in June 2021 and special-district assessments gradually phasing back in. However, ATN was still able to stay afloat, retaining enough staff to maintain assets during the pandemic and then reopen, largely through federal support. ATN received funds from all three stimulus bills, as a subrecipient of OCTA, and as a nonprofit, was also able to get a forgivable federal business loan through the Paycheck Protection Program (PPP). Our interviewee credited these federal dollars with getting ATN through the pandemic and averting a total shutdown of the system.

The City of Irvine, on the other hand, did indeed fully shut down its transit lines. The iShuttle service—a bus system that largely provides connections between the nearby Metrolink commuter rail stations and major employment hubs—is planned by the city and operated by OCTA. Given the system's focus on first-mile/last-mile connecting service for office workers, most of whom shifted to working from home during the pandemic, the city closed all six routes from mid-March 2020 to the end of June 2021. After providing OCTA with a three-month notice, the city restarted four routes in July 2021, after consulting with area employers on their return plans and determining that the major workplaces on the other two routes would still be doing mostly remote work. After reopening, however, the system only carried around 20 percent of its pre-pandemic ridership.

While the iShuttle example represents one of the region's most drastic responses to the pandemic among transit operators, the shutdown of service largely was not a result of financial difficulties. Irvine mostly funds iShuttle through a special fund: when a planned streetcar line through Irvine was canceled in the first decade of the 2000s (Pignataro, 2019), OCTA agreed to return committed municipal funds for the project to Irvine to instead fund their

bus system through around 2040. If Irvine does not use some or all of these funds in a given year, these dollars are not lost; rather, they roll forward and extend the duration of the fund (Irvine did use a very small share of these funds during the pandemic to cover some fixed costs.). Other support for iShuttle comes from a grant program from OCTA to cities in the county for circulator routes. Because of this funding structure and because the city contracts out the operation of the service to OCTA, the city was able to close their system without incurring major costs nor forfeiting funding during the shutdown. So despite iShuttle not receiving federal transit stimulus funds, the iShuttle closure was not a case of financial hardships driving operational changes.

Workforce Responses

Aside from the few, smaller Southern California operators that did fully close, most transit agencies reported having sufficient funding throughout the pandemic to generally avoid major layoffs. Operators ranging in size from LA Metro to medium-sized Metrolink and Foothill Transit to the smaller Antelope Valley Transit Authority and Gold Coast Transit all not only avoided layoffs but also did not furlough any operators either (Hymon, 2020b). While other operators like Omnitrans did lay off some workers and others like Access Services saw their contractors implement furloughs, these were relatively small and brief labor cuts, with workers offered work back when service was restored. Omnitrans' cuts were no worse than their already planned downsizing.

Budgetary realities and conservative financial planning did, though, lead to other strategies to make workforce cuts. Early in the pandemic, many operators encouraged workers to take early retirement options or offered buyouts for voluntary separations (Hymon, 2020b). While layoffs and furloughs were much smaller than initially feared, agencies did reassign some workers to other duties—such as drivers for Access Services delivering meals instead of passengers. Some agencies paid operators even when service cuts or other disruptions meant that they did not actually drive on certain shifts; others had workers draw down their accrued paid leave in such situations. Foothill Transit reimbursed its contractors to provide extra training to workers who had no work available, the first time the agency had done so. And regardless of pandemic finances, the SARS-CoV-2 virus infected many vehicle operators and other workers. Many workers called out sick, especially during periods of surging coronavirus cases. Others had to take off to care for sick family members, to quarantine after exposure, or to provide childcare for their children when schools, daycare centers, and other childcare options closed or were unavailable.

The precautionary workforce measures taken by many agencies appeared prudent to most observers at the time, when fears of a severe and prolonged economic downturn were widespread, but in retrospect may have inadvertently exacerbated their current labor challenges in 2022, as discussed below. Early in the pandemic, a number of agencies implemented hiring freezes, salary freezes, freezes on promotions, and other measures to keep labor costs in check. Again, the financial outlook at the time for the industry was bleak. However, the pandemic pause on new bus operator hires at LA Metro, for one, has contributed to their current crunch in filling operator vacancies. Many applicants who were in their system at the time of the freeze have since found other work (Uranga, 2022 and Fonseca, 2021). The aftermath of hiring freezes has also left operators in other parts of the U.S. scrambling today (Kamisher, 2021). The salary and promotional freezes, meanwhile, may have contributed to employee burnout and quitting, according to an interviewee.

Capital Projects

Unlike transit operations and the transit workforce, transit capital projects have remained relatively unaffected by the pandemic and pandemic-related budgetary changes. Of the 19 agencies that responded to a survey question on capital planning, 13 reported no reductions in capital funding or disruptions to projects. Four noted that most of their planned expenditures were already underway at the start of the pandemic and proceeded apace. Three even had capital project timelines accelerated during the pandemic. Only one agency reported project delays.

All of our interviews reflected similar themes. Pre-pandemic, operators had received more significant federal support for capital projects than operations, and this put them on more stable footing on the capital side when the pandemic hit. Many operators, especially larger agencies, either continued or expedited their capital projects during the pandemic. Funds were already programmed, and significant decreases in ridership and temporary drops in street congestion made otherwise disruptive construction projects easier to schedule and complete. A few smaller agencies delayed capital projects, though less because of funding shortfalls than funding uncertainty and a lack of institutional resources to manage it. Consistent with the quantitative data presented above, actual capital expenditures varied greatly across agencies and from year to year within agencies, but even those systems that reduced capital spending for a period at the start of the pandemic (See **Figure 8**), the actual work on capital projects continued, drawing previously obligated funds.

Many of the operators whose staff we interviewed are in the midst of transitioning part or all of their fleets to electric buses, spurred in part by state mandates. Procurements of new vehicles and construction of supporting infrastructure like charging stations mostly began prior to the pandemic, and most delays since then resulted from factors like supply chain issues at vehicle manufacturers. We found no noticeable relationship between agency characteristics and the likelihood to have experienced procurement issues during the pandemic. In fact, having fully met its operational funding needs, Culver CityBus is using some of its ARP stimulus funds on a bus electrification project.

As the pandemic necessitated new purchases and equipment to keep riders and staff safe, operators varied in whether they used their capital or operational budgets to pay for these newly introduced COVID-19 precautions. Some agencies used both capital and operating funds, purchasing larger equipment for stations and vehicles with capital funds and staff-level equipment like personal protective gear with operating funds.

Looking Ahead

In this section, we consider the fiscal dimensions of four major issues and opportunities facing Southern California transit operators in the months and years ahead. We first consider the vexing labor shortages that are currently hamstringing the provision of transit service in many parts of the region, and what transit systems are considering to address the problem. We then consider the ramifications of the pandemic-driven experiment with fare-free transit and its prospects for the future. We close with a discussion of how transit operators in Southern California are planning for a post-pandemic future of altered service demand and potential financial shortfalls and examine what the recently passed bipartisan federal infrastructure bill means for federal transit funding in the years ahead.

Workforce Challenges

While the mind's eye may think first of rail cars whisking through subway tunnels and across overhead structures or of seemingly ubiquitous buses trundling down city streets, public transit is, first and foremost, a labor-intensive, service industry. Indeed about seven out of every ten dollars spent on transit operations goes to salaries, wages, and fringe benefits (Dickens, 2021).[15] Even before the pandemic, a tight labor market in the public transit industry was hampering the smooth operation of service throughout the U.S. Drivers had been shying away from the industry because of the often arduous nature of the job (long, non-standard, or unpredictable hours; constant need to pay attention to the road and vehicle while also collecting fares and interacting with riders; etc.); sometimes low wages and/or limited benefits (though these vary significantly from system to system); fear of assault and confrontations; having to address mental health crises, homelessness, harassment, and other issues among passengers; growth of delivery and shipping jobs that may pay better wages and do not require direct customer interaction; and long-term concerns over job losses due to the prospect of eventual vehicle automation (Bliss, 2018 and Fink, 2012). The COVID-19 pandemic exacerbated many of these concerns and has led to deeper and occasionally crisis-level labor shortages in the industry. Transit systems around the country report that they are struggling to retain and hire bus and train drivers (Cetoute, 2022; de la Garza, 2020; George, 2022; Kamisher, 2021; Little, 2022; Rosenberg, 2021; Savage, 2022; and J. Walker, 2021).

Southern California transit agencies report that they are losing vehicle operators and other front-line employees in droves and attracting fewer and fewer new hires to fill vacancies. LA Metro, for instance, has 40 operators leaving per month as of writing. The agency saw 1.7 times more drivers leave than start in the second half of 2021 (Fonseca, 2022). At Omnitrans, only 30 to 40 percent of operators who were laid off earlier in the pandemic returned to the agency when offered. OCTA, which operates Irvine's iShuttle, required three months' notice to restart service because of worries that OCTA could not find enough drivers. One interviewee described the labor situation as the worst they had encountered in over a decade on the job. Besides vehicle operators, other positions like mechanics and cleaners are also falling vacant. We heard from bus, rail, and paratransit systems about labor shortages and the operational consequences thereof; at LA Metro, where train operator vacancies are filled by recruiting from current bus drivers, a shortage in the latter has cascaded into the former.

---

[15]. According to the American Public Transportation Association, 61% of operating expenditures are for labor expenses on transit directly provided by an operator. Another 15% are for purchasing transit service from other providers. Assuming that same 61% labor breakdown for this "purchased transportation," this totals to 70% on labor (Dickens, 2021).

Interviewees and reports we reviewed identified both “push” and “pull” reasons for the current labor crunch (Rosenberg, 2021). In Southern California as in the rest of the nation, the factors above that often make front-line transit difficult worsened during the pandemic. Enforcing mask mandates, responding to growing numbers of unsheltered riders, and restarting fare collection have all contributed to burnout, fear, and stress—and quitting and early retirement—among vehicle operators (Kamisher, 2021; Rosenberg, 2021; Savage, 2022; and Kamal, 2022). And of course, as essential workers themselves, operators continue to contract and suffer from COVID-19, particularly during the December 2021 to present (February 2022) Omicron variant surge. In January, LA Metro reported over one in ten operators out sick, its highest rate of the whole pandemic (Uranga, 2022), with around 20 percent more out due to quarantine from potential exposure or to care for relatives with COVID-19 (*Mass Transit*, 2021). After getting sick or out of fear of getting sick, transit workers have been further prompted to leave, and new recruits are less likely to join. Conversely, one interviewee mentioned that vaccination mandates have also created difficulties in hiring. At LA Metro, 17 percent of bus and train operators are unvaccinated but are working nonetheless (Uranga, 2022); in other parts of the country, vacancies remain unfilled after operators were fired for not vaccinating (Kamisher, 2021).

Meanwhile, drivers are leaving for jobs in other industries or with different responsibilities. Driven largely by forces across the labor market—extremely low unemployment, high inflation, pandemic financial relief, and other macroeconomic trends—the so-called “Great Resignation” has hit the transportation sector. Retail, restaurant, hospitality, and other customer-facing jobs are those with the highest recent rates of quitting, as workers have, on the whole, more opportunities, time, and bargaining power to seek higher-paying jobs and jobs with better working conditions (Rosalsky, 2022). Interviewees repeatedly noted that transit operators have taken jobs in other sectors instead, especially those that do not require stressful customer interactions. With the delivery and shipping sectors booming, drivers with commercial licenses are moving to trucking jobs, where companies may not pay as much in the long-run but are offering high up-front signing bonuses (Gordon, 2021).

This staff shortage is hurting transit service across the region. Back in January 2021, both vacancies and drivers calling out led LA Metro to cancel around ten percent of vehicle runs (*Mass Transit*, 2021). A year later, the agency has found itself canceling 15 percent or more runs some days (compared to only 1-2% pre-pandemic) (Cheung, 2022). These cancellations are not evenly distributed, with lower-income and more transit-dependent parts of the county seeing more missed runs, with different routes unpredictably having cancellations each day, and with some lines seeing half of trips canceled (LA Metro, 2021; Fung, 2022; Linton, 2022a; and Fonseca, 2022). OCTA has likewise canceled many trips due to driver call-outs in recent months (OCTA, 2022). Interviewees at agencies large and small reported missed runs and longer headways as a result, especially since Omicron. This echoes effects across the U.S., where staff shortages and illness have caused longer waits, heavier crowding, and more delays, particularly from transit-dependent riders (de la Garza, 2020; Rosenberg, 2021; and Savage, 2022).

Without a clear end to these labor issues in sight, agencies around the U.S. and in Southern California have had little immediate choice but to cut service on an ongoing basis to match available workers (Cetoute, 2022; George, 2021b; Duncan, 2022; Little, 2022; and J. Walker, 2021). The goal of these cuts is to at least make the service offered more predictable and adherent to published schedules. For example, LA Metro reduced scheduled service by around 12 percent, effective February 2022 (Fonseca, 2022; Linton, 2022b; and Uranga, 2022).

Beyond these labor-shortage induced service cuts, transit agency managers have scrambled to respond in other ways as well. Systems are both encouraging and ordering drivers to work extra hours on planned days off, and shifts are lengthening. But these “ordered call backs” risk inducing a further resignation spiral, as they decrease

morale and prompt further staff to leave (Linton, 2022a; Cheung, 2022; and Fung, 2022). Supervisors at some agencies are increasingly covering shifts for operators who fall sick. To attract new workers, operators have begun offering signing bonuses: $1,500 upon hiring and $1,500 after a year on LA Metro, $3,000 at Foothill Transit, $2,000 at Gold Coast Transit, and $1,000 at Omnitrans (Fung, 2022). These bonuses are easier to enact than increases to wages themselves, though an interviewee raised the issue that they treat current workers unfairly compared to new hires. LA Metro did also recently adopt a six-month pilot to raise its starting hourly pay for new trainees from $17.75 an hour to $19.12. Agencies are also increasingly advertising job postings, stressing the opportunities for future raises and promotions, benefits and retirement plans that are generally better than what private-sector firms offer for comparable jobs, and the intangible benefits of working as a bus operator. Throughout 2021, LA Metro put out calls to hire 500 to 800 new bus and train operators (Pilla, 2021; Scauzillo, 2021; and Fonseca, 2021).

While transit agencies are competing for workers with other sectors, they are also competing amongst themselves. One interviewee lamented that their agency has not offered as high wages as others in the region, worsening their labor shortage now, though they plan to raise them soon. Another interviewee noted that their agency's lack of a sign-on bonus was hurting their recruitment efforts. Yet another worried about training drivers only to lose them to another agency afterwards. A staffer at an agency farther from the region's core observed that finding drivers was especially hard in their outlying service area. Yet at LA Metro, the largest operator in the region, starting pay is lower than on many other Southern California transit operators, even as pay for more senior drivers is comparatively high. Unlike others, LA Metro drivers start only part-time during training, and afterwards, could be sent to depots across a wide swath of the county.

We found some distinctions between operators that directly employ drivers versus those that contract to a private transit company to provide service. To be clear, both sets of operators are suffering from labor shortages and attendant effects on service. And in both cases, drivers are generally unionized workers with benefits. However, agencies that contract out service are less able to directly respond to labor shortages—but also generally do not have to immediately bear the costs of efforts to attract and retain workers.

The details of service contracts vary immensely not only between agencies but also within agencies, as some contract out service in different areas to different companies. But broadly, because these contracting agencies do not directly employ or pay drivers, they do not directly set wages and individual working conditions and cannot offer to improve them in response to vacancies. Interviewees mentioned that contracts with private transit providers might have wage thresholds or that firms' bids may be awarded extra points for higher wages, but during the term of a contract, agencies cannot themselves adjust wages. On the other hand, if contracted firms have to raise wages or benefits in order to provide contractually required service levels, the firms generally bear those costs themselves, not the agency, unless the contracting agency were to agree to a contract amendment. Thus, while agencies with contracted service are feeling the operational effects of labor shortages, they are, for the most part, not experiencing negative financial effects from it, yet. To be sure, there are some indirect budgetary consequences: Metrolink, for instance, is currently receiving less fare revenue than they had hoped for, because their contractor cannot hire enough workers to restore service more fully. In the years to come, though, interviewees predicted that their agencies would end up taking on these increased labor costs. Bids for the next term of service contracts will likely be higher, as firms ask for more funding to compensate for higher labor expenses.

Agencies that directly employ drivers have a slightly different set of challenges. Along with signing bonuses, these operators can raise wages, and many are planning to do so. However, there are hurdles here too. While LA Metro

did raise its starting operator wage as a temporary pilot, most operators are waiting (or must wait) until the next scheduled contract negotiation with their driver unions to adjust wage scales. For municipal operators, such modifications may also need approval from a civil service commission and/or a city council. Thus, for different reasons, most transit agencies, regardless of their business model, are unable to nimbly respond to operator shortages through changes in pay rates and benefits. Because of increased need for overtime work, though, agencies have effectively raised wages for drivers still working through the current crisis (Linton, 2022a).

Our interviewees tended to agree that the factors behind the current labor shortage are less a matter of agency finances and more one of macroeconomic trends. Mirroring discussions in the media (George, 2022; Kamisher, 2021; and Linton, 2022a), they differed on the degree to which they believe higher wages would make an immediate dent in the issue, considering the non-monetary hardships of being a bus driver that could outweigh higher wages but also noting the direct pressures of inflation/rising cost-of living and wage competition. Either way, labor issues, far more than budgetary ones, are stymying returns to full service for Southern California transit.

Finally, one other effect of current labor issues is that agencies are finding it easier to scale down extra COVID-19-related measures, whose costs may not be sustainable long-term. One agency that added a team of cleaners to sanitize buses between runs has been able to get the team to a more manageable size without laying off anyone, just by not filling vacancies after cleaners have left.

Prospects for Fare-free Transit

While the particulars of the pandemic complicate comparisons, the pause in fare collection across many Southern California transit operators, especially LA Metro, represented the “biggest free-transit experiment in the U.S.” (A. Walker, 2022). Prior to the pandemic, a few transit policymakers in the region had been studying the potential advantages of fareless transit. Notably, now-former LA Metro CEO Phil Washington proposed a fare-free system by 2028 funded by a regional congestion pricing system (Chiland, 2018). COVID-19, though, pushed agencies to experiment with fareless transit on public health grounds far faster than that schedule. The results revealed some definite upsides: higher relative pandemic ridership compared with agencies elsewhere that never or only briefly suspended fares, faster travel due to less “dwell time” at stops waiting for boarding passengers to pay their fares, no fare collection or enforcement expenses, no imposition of fare-evasion fines on riders who often struggle to pay them, and less potential for escalation of fare check encounters with law enforcement (A. Walker, 2022 and Barnes, 2022).

But fare revenues cover nearly a third (31%) of transit system operating costs nationwide (Dickens, 2021) (though in Southern California, the pre-pandemic farebox recovery ratio ranged anywhere from five to 85 percent). So, eliminating fares permanently could require either cutting costs (and presumably service) or securing a new revenue source to replace foregone fare revenues. The massive infusion of federal funding filled the gap left by pandemic-fueled fare revenue losses to an extent that may not be replicable in the future without a new revenue source for transit.

Regardless of the benefits, costs, and tradeoffs of fare-free transit, we found in our interviews that few agencies are considering, much less planning for, fare-free transit in the future. The transit experiment in fare-free transit was born of a public health necessity for most Southern California operators, and for the most part, they do not foresee keeping or reinstituting it post-pandemic. In our survey (and follow-up clarification questions), none of the

responding agencies have decided on eliminating fares on an ongoing basis, and just two report that they are even considering it. Suspending fare enforcement checks and reducing fare prices are under consideration or are being implemented at a few agencies, but most respondents plan to stay the pre-pandemic course. Below, we describe the current thinking and planning of transit finance and operations staff on fare-free transit to offer insight—not necessarily to endorse or oppose the idea but to present current policy debates by the region's transit agencies regarding fares.

Some interviewees did not dismiss the possibility of fareless service, but raised lost revenues as a major obstacle to adoption. Likewise, all but two survey respondents named lost revenue as an important drawback going fare-free. Of the four surveyed agencies that reported at least considering modifications to fare policies, three stated that they will/would seek additional federal, state, regional, and local revenue sources to make up for lost revenue, and three will/would cut administrative or other costs to offset fare revenue losses. No interviewees brought up other revenue sources on the horizon to replace fares; one even suggested that the scale of a tax to fund fareless service would be too much for the local economy to bear. Support for fare-free transit was included in various versions of Congressional Democrats' and President Biden's Build Back Better plan, on which LA Metro staff had hoped to draw for its planned longer-term fareless programs, but as of writing, it appears unlikely to pass. Without such a revenue source, the staff interviewed generally did not see a sustainable financial path to permanent fare-free transit.

Other interviewees cited benefits of charging fares and expressed a desire to maintain them. Some staff mentioned an observed rise in homelessness on fare-free vehicles as one significant reason, especially given increases in homelessness during the pandemic. Homelessness was the second-most commonly given drawback in our survey. In the view of several interviewees, housed travelers stopped riding transit, decided not to start riding, or felt unsafe when they did ride, due to behaviors of unhoused riders (or those perceived to be unhoused). Many of these staff acknowledged that unhoused people had fewer or no other places to shelter, but also described a lack of transit agency capacity to house unhoused riders and to address a larger, societal problem without diverging from transit's core mission.

Interviewees also suggested that increased drug use, crime, and mental health episodes on vehicles were consequences of fareless transit, and safety came up as a common response in the survey, too. These tied in, too, to labor issues: according to driver surveys at interviewees' agencies, bus operators reported feeling unsafe during fareless periods and ill-equipped to address the issues onboard that interviewees attributed to fare suspensions. One interviewee predicted that finances would not actually stop their system from dropping fares, but that these social issues would.

Demand for paratransit service for elderly and disabled riders has long exceeded available capacity prior to the pandemic, which led most systems to adopt a variety of service rules (e.g. limiting service area coverage, requiring advanced reservations, prioritizing trip types, etc.) to bring demand more in line with available service supply. So, it is perhaps not surprising that some of our interviewees worried that a fareless, on-demand system would increase demand too much, too quickly, leaving paratransit agencies overwhelmed operationally and financially. Indeed, Access Services advised LA Metro to consider the effects on paratransit in LA Metro's own fare-free discussions, since Access Services' fares are limited (by law for federal funding claimants) to no more than twice LA Metro's fares, and, of course, twice $0 is $0.

Another system financially "backstopped" by agreements with other governments, Metrolink, has discussed fare-free commuter rail service, but agency staff there expressed concerns that replacing lost fare revenue would put

too much of a strain on its contributing counties, particularly the smaller ones. In a counter-argument to the equity case for universal fare-free transit advanced by many advocates, one interviewee suggested that universal fare-free transit was less fair than having higher-income riders pay and lower-income riders receive discounted or free fares through targeted programs. Finally, an interviewee also mentioned the value for system planning of having trip data collected from smart-card fare payment.

Agencies are nonetheless reexamining their fare policies more broadly. Many already offered free or reduced fares to certain groups of riders, such as students and seniors, in some cases to comply with federal transit subsidy guidelines and in others to reflect their system's policy goals. Prompted in part by the pandemic, some transit operators are working on expanding these programs, and in a few cases are pursuing state and regional grant funding to do so. The Antelope Valley Transit Authority, for instance, is looking to expand its free fare program (which currently covers seniors, military personnel, and some college students) to unhoused high school and college students. Culver CityBus matched its new fareless program for its school district's students with additional service to those schools, paid for by the district. The Fareless System Initiative (FSI), led by LA Metro, provides elementary, middle, and high-school students stored-value "TAP cards" for fare-free rides on 13 Los Angeles County transit operators (Linton, 2021c). LA Metro's FSI is the largest effort in the region to reduce the cost of riding transit, and along with the student program, includes discounted fares to low-income riders through the Low-Income Fare is Easy (LIFE) program. LA Metro staff have gone to considerable lengths to make it easy for riders to sign-up for the program, including adding the option for LIFE applicants to self-attest their income in the application, instead of being required to submit documentation (LA Metro, 2022a). According to interviewees, LIFE sign-ups are quite high, and the board has set a goal to double them. Yet while the barriers to enroll are lower than comparable fare programs, the over 100,000 enrollees by January represented just a fifth of daily ridership that month, on a system where the substantial majority of riders are low-income and would qualify (A. Walker, 2022). As LA Metro reinstated fares in January, it also offered half-price passes and free 90-day LIFE passes. All of these programs, though, have used LA Metro's remaining stimulus funding faster than anticipated.

Aside from these targeted efforts, full fare-free transit is not part of medium-term agency plans, despite—or perhaps because of—the pandemic experiment. Regarding the reported social problems on vehicles due to fare-free transit related by many of our interviewees, we lack the data to evaluate to what degree these consequences actually follow from suspending fares. But many staff with influence on fare policy believe they do, especially after the pandemic. By contrast, interviewees generally did not bring up benefits of fareless transit, such as increased ridership, reduced vehicles miles traveled in cars, and decreased citations of and violence toward riders of color (A. Walker, 2022 and Barnes, 2022) (the last noted by a Bus Riders Union organizer, effecting reframing the relationship between safety and fare-free transit from the concerns above (Barnes, 2022)). However, survey respondents in the region did most commonly select "equity concerns for low-income riders" as a benefit of their agency potentially eliminating fares, with increased ridership as the next-most-selected. But these did not seem to outweigh the costs, in their agency's current judgment.

LA Metro's FSI does stand out as a substantive program to examine the path to fare-free transit, but its future expansion beyond targeted fare discount programs seems to depend on a large, new, politically difficult funding source, like an item within a larger federal spending package or congestion pricing. Regardless, one interviewee suggested that the path to actually implementing fareless transit would have to be regionwide, potentially led by LA Metro. A regional funding source might better sustain fare-free service than a local one. Once a critical mass was reached, operators would be progressively encouraged to join, as participating agencies would likely see higher ridership—and therefore receive more in federal and state formula funding—than those that did not.

Future Planning

The End of Federal Stimulus Funds and Uncertain Ridership Scenarios

The federal stimulus funding greatly stabilized transit agency budgets, but they are not permanent. The three bills represent a one-time (or, more accurately, a three-time) intervention, but according to FTA staff we interviewed, the federal government is likely returning to its previous role as primarily a capital funder, come what may during the pandemic recovery and beyond. Thus, while agencies in the region for the most part weathered the pandemic's financial effects thanks to the surfeit of federal support, they must plan for a future in which ridership continues to return sluggishly or incompletely and most federal operating support has ended.

The federal stimulus funding, though, is still supporting transit in the region at this writing. The funds from the first two federal stimulus bills never expire, and the funds from ARP must be spent by 2029 (See **Table 3**) (FTA, 2021d). Some agencies are still spending down CRRSA funds and/or have programmed out ARP funds to last for at least another fiscal year, if not longer. Among the 15 Southern California transit agencies that responded to our survey question about their stimulus spending plans, six reported expecting that their stimulus funds will be fully spent this fiscal year (FY 2022) and eight have planned to fully spend them all next fiscal year (FY 2023); only one, the City of Los Angeles Department of Transportation, foresees them lasting longer.

From our analysis of agency budgets and staff interviews, we found a roughly even distribution between those on track to spend down their stimulus funds in the near term versus stretching them out to last longer into the future. The systems spending them faster tend to be smaller; they often had a larger reliance on fares as a main funding source and therefore had a more pressing need for the funds to backfill fare revenue losses. The agencies that have programmed the funds over multiple years tended to be larger and have more consistent sources of funding throughout the pandemic. Staff at these slow-spending agencies expressed to us that stimulus funds would be used as a hedge against ongoing uncertainty during the recovery period. However, not all agencies aiming to stretch their federal relief funds are succeeding in doing so; for instance, at LA Metro, ARP funds have covered unplanned cost overages in the agency's policing contracts with municipal law enforcement agencies and the county sheriff's department.

Meanwhile, interviewees expressed great uncertainty about how long ridership will take to return to pre-pandemic levels, if ever. The rate at which riders return may determine whether a gap opens between agency revenue sources (with still-lagging fare revenues and a spend-down of federal operational support) and continued high costs of providing service. Such a gap could require service cuts in the years to come (perhaps most charitably framed as "service right-sizing," if indeed ridership remains depressed). Accurately forecasting future ridership demand and patterns are beyond the scope of this report and, given the immense uncertainty and substantial differences from prior periods of ridership downturns, largely beyond the capacity of most transit operators and regional planning agencies as well. A few interviewees did offer that they did not anticipate that ridership will fully recover for at least four to five years from the start of the pandemic, with factors like high gas prices potentially speeding up the timeline.

The character of transit ridership may also change, and most Southern California transit agencies are adapting their service and financial strategies in response or planning to do so. As described above, demand for peak-hour, peak-direction commuter service fell more steeply and more lastingly than other trip purposes and times, as did rail transit ridership relative to bus ridership. Agencies are responding by restoring service first on local routes before express commuter routes and by making cuts necessitated by current labor shortages to the latter first.

Reflecting on the possibility that downtown office work may never return in full, staff at Metrolink are considering how the rail system can reorient its service patterns away from the commute to serve other trips markets (Metrolink, 2021).

A few agencies are conducting financial and operational post-pandemic planning exercises. In their 2021 strategic business plan, Metrolink mapped out five future scenarios, defined by levels of available operating and capital resources, and matched them to a range of service, marketing, technology, and connectivity strategies and timelines possible for each. Under the most resource-constricted scenario, staff forecast ridership to rise into 2025 but fall again for the next half-decade, rebounding only slowly thereafter until 2050. While other scenarios with more available funding have much rosier ridership projections, staff forecast higher system subsidies under all scenarios for the next four years or so, as ridership and fares return more slowly than stimulus funds spend down (Metrolink, 2021). A smaller operator, Gold Coast Transit in Ventura County, has also projected out revenues and ridership. Staff there foresee a slow recovery: only around $2.25 million in fare revenue by FY 2025, down from about $2.75 million in FY 2019, with budgets in FY 2024 and FY 2025, after stimulus dollars are spent, lower than in FY 2022 and FY 2023.

Federal Infrastructure Bill

In November 2021, President Biden signed the $1 trillion Infrastructure Investment and Jobs Act (commonly called the “Bipartisan Infrastructure Bill/Law/Framework/Deal”), a combined and expanded reauthorization of the federal government’s surface transportation program, with an additional series of capital investments in various types of infrastructure. The bill provides $108 billion in public transportation funding nationally over FYs 2022-2026, the U.S.’ largest such investment (in nominal dollars) in transit and a jump of around 75 percent in annual federal transit spending from the previous five years. The bill includes additional funding for several formula programs, including the Urbanized Area Formula Funds (§ 5307), State of Good Repair grants to maintain existing infrastructure, and rural funding. It also introduced or expanded a number of competitive grant programs to fund projects like electric bus procurement, bus facilities, replacement of rail vehicles, new ferry services, and accessibility improvements. These funding programs are aimed at advancing the key priorities of safety, modernization, climate, and equity, to a degree more focused and better funded than much of prior federal transportation legislation (Tankersley, 2021; FTA, 2022a, 2022b; FHWA, 2022; White House, 2021; and Crowell and Moring, 2021).

Despite its size and scope, the infrastructure bill does not squarely address the operational needs and uncertainties of transit agencies, detailed in this report. The vast majority of the bill’s funds are for capital projects, not operations, save for the same type of operational assistance to small urban and rural systems provided before the pandemic as well. The law largely did not change the pre-pandemic requirements and allocation methods of federal capital funding formulas, including local match requirements, and only slightly raised the ratio of federal transit spending to highway spending. To be sure, urban U.S. transit systems operated without much federal operations support before the pandemic, so the federal government expecting that they will do so afterwards is not a surprise. And the increased funding for state-of-good-repair and modernization projects will hopefully help transit agencies not just expand service but maintain their current vehicles and other infrastructure better. The bill also significantly expands the U.S. Department of Transportation’s discretionary grant programs, potentially allowing the FTA to support transit agencies more flexibly or more according to their priorities (FTA, 2022a, 2022b and Fitzgerald, 2021). All told, the bill does promise substantial improvements to transit systems’ long-term construction and upkeep of their vehicles, routes, and facilities, but it does not, nor was it designed to, address short- to medium-term finance questions for transit operations.

Final Words

This is in many ways a positive story about a dark time.

The COVID-19 pandemic altered life in Southern California and around the globe in ways that would have been difficult to imagine in 2019. Work, shopping, socializing, and travel were initially transformed dramatically, and then incrementally for the next two years as of this writing. Public transit systems, at their very core, bring people together in close proximity to efficiently move them in the same direction at the same time to desired destinations. But for the last two years, gathering people closely together—in a restaurant, a nightclub, or on a bus—has been fraught with uncertainty.

As a result, travel on public transit, in Southern California and around the globe, plummeted more than travel by other means early in the pandemic, and was slower to recover in the two years afterward (Apple Maps, 2022). Those who continued to ride transit during the pandemic and those who have returned to it so far disproportionately do not have reliable access to cars, tend to reside in low-income households, and are more likely immigrants and/or people of color. Thus, public transit's role as a social service for disadvantaged travelers (Taylor and Morris, 2015) has become more central than ever during the pandemic. But public transit systems, reliant financially on both riders' fares and taxpayers' subsidies, were suddenly staring into a financial abyss in the early spring of 2020.

Against this dismal and potentially devastating backdrop for public transit in Southern California, Congress passed and two Presidents signed not just one but three major financial relief packages that literally rescued public transit in Southern California (and the rest of the U.S. as well). In concert, the three bills provided an additional $4.4 billion in funding for public transit in the region alone (See **Table 4**), and with many fewer strings on its use than with most federal grants (See **Table 3**). Our research reported here finds that this funding plugged short-term losses in tax revenues and more persistent shortfalls on fare revenues due to depressed ridership—and will continue to do so on most Southern California transit systems for at least another year. While slow-to-return riders promise to keep fare revenues down for at least the medium term, the global and California economies bounced back quickly after the initial pandemic-induced collapse, which has caused most local, regional, and state subsidy sources that finance transit in Southern California to bounce back as well. In fact, the principal dilemma facing the region's transit operators in 2022 is not a depressed economy, but an overheated one plagued by labor shortages, supply-chain bottlenecks, and inflation.

While the February 2022 transit picture in Southern California is far from rosy, neither is it bleak. To wit, while Southern California transit ridership had fallen more steeply than the nation as a whole in the half-decade leading up to the COVID-19 pandemic (Taylor et al., 2020), transit use dropped less in the region early on in the pandemic than in most other places and since then, it has recovered faster (FTA, 2021b) (See **Figure 1**).

While heartening, the region should aspire to more than simply losing fewer transit riders than other areas. Since 1990, Southern California has added over 100 miles of heavy (subway-like) and light (streetcar-like) rail transit service and over 500 miles of commuter rail service (Manville, Taylor, and Blumenberg, 2018). However, much, though not all, of this new rail service is oriented around major office centers, in particular downtown Los Angeles. These are precisely the worksites where employees have been slowest to return and where transit patronage losses have been greatest throughout the pandemic (Paul and Taylor, 2022). Bus service is, of course, more

flexible, and many of the transit system staff we interviewed for this study are examining how patterns of transit use have shifted away from peak periods and traditional office centers and have altered or are preparing to alter their service accordingly. Indeed, the pandemic has reinforced the value of nimble transit planning: small operators coordinating with major employers on their respective returns to pre-pandemic operations, large agencies adapting to labor shortages by raising wages and improving working conditions, and regional planning bodies improving formulas and swapping funds to best balance the changing needs of operators and riders.

With respect to finance, the positive takeaway from this dark time is that a major federal public policy intervention *worked*; in Southern California it largely kept a regional public transit system composed of around 100 individual service providers financially afloat and able to serve many of the region's most disadvantaged travelers through an enormously challenging time.

While the region's public transit systems will face many challenges in the months and years ahead, several of which we discuss in this report, imminent financial collapse is not one of them. That we could not have made such an assertion when we commenced this research in the fall of 2020 speaks to how much the pandemic, public transit, and public policy have evolved since then.

References

Agrawal, A., King, H., Wachs, M., and Marks, J. (2020, December 22). *The Impact of the COVID-19 Recovery on California Transportation Revenue: A Scenario Analysis through 2040* (WP 2054). Mineta Transportation Institute. Retrieved February 11, 2022, from https://transweb.sjsu.edu/research/2054-Impact-COVID-19-Recovery-California-Transportation-Revenue.

Aiyer, B. (2021, March 8). With Revenue Declining and Costs Increasing, Sound Transit Lobbies for State and Federal Aid. *Cascadia Advocate*. Retrieved January 28, 2022, from https://www.nwprogressive.org/weblog/2021/03/with-revenue-declining-and-costs-increasing-sound-transit-lobbies-for-state-and-federal-aid.html.

Apple Maps (2022, February 13). Mobility Trends Reports. *Apple*. Retrieved February 14, 2022, from https://www.apple.com/covid19/mobility.

APTA Cleaning and Disinfecting Vehicles and Facilities Technical Advisory Group (2020, June 22). *Cleaning and Disinfecting Transit Vehicles and Facilities During a Contagious Virus Pandemic* (APTA SS-ISS-WP-001-20). American Public Transportation Association. Retrieved February 7, 2022, from https://www.apta.com/wp-content/uploads/APTA_WP_Cleaning_and_Disinfecting_Transit_Vehicles_and_Facilities_During_a_Contagious_Virus_Pandemic_FINAL_6-22-2020.pdf.

Armantier, O., Goldman, L., Koşar, G., and van der Klaauw, W. (2021, April 7). An Update on How Households Are Using Stimulus Checks. *Federal Reserve Bank of New York*. Retrieved February 8, 2022, from https://libertystreeteconomics.newyorkfed.org/2021/04/an-update-on-how-households-are-using-stimulus-checks/.

Awad-Núñez, S., Julio, R., Gomez, J., Moya-Gómez, B., and González, J. (2021, March 10). Post-COVID-19 Travel Behaviour Patterns: Impact on the Willingness to Pay of Users of Public Transport and Shared Mobility Services in Spain. *European Transport Research Review*, *13*(1), 20. https://doi.org/10.1186/s12544-021-00476-4.

Barnes, K. (Dir.) (2022, January 11). No Fares, No Police: How Free LA Metro Could Make Buses and Trains Safer. In S. Chiotakis (Host), C. Bordal, K. Barnes, and N. Patel (Prods.), J. Meaney, C. Martinez, and J. Wasserman (Guests), *Greater LA*. KCRW. Retrieved January 31, 2022, from https://www.kcrw.com/news/shows/greater-la/public-transit-homeless/la-metro-fares-return.

Berger, P. (2020, June 24). New York's MTA to Consider Service, Job Cuts as Coronavirus Further Imperils Finances. *Wall Street Journal*. Retrieved January 28, 2022, from https://www.wsj.com/articles/new-yorks-mta-to-consider-service-job-cuts-as-coronavirus-further-imperils-finances-11593033672.

Bliss, L. (2018, June 28). There's a Bus Driver Shortage. and No Wonder: Why Doesn't Anyone Want to Drive the Bus? *CityLab*. Retrieved January 19, 2022, from https://www.bloomberg.com/news/articles/2018-06-28/there-s-a-bus-driver-shortage-and-no-wonder.

Bliss, L. (2020, December 22). For Public Transit, the Stimulus Is a Lifeline — but a Short One: The $900 Billion COVID Relief Bill Includes $14 Billion in Aid for U.S. Transit Agencies, with a Bigger Share Heading to the Cities That Need It Most. That's Not Enough to Plug Funding Gaps. *CityLab*. Retrieved February 8, 2022, from https://www.bloomberg.com/news/articles/2020-12-22/transit-gets-a-reprieve-not-a-rescue-in-stimulus.

California Health and Human Services (2022, February 8). COVID-19 Time-series Metrics by County and State. *CHHS Open Data*. Retrieved February 8, 2022, from https://data.chhs.ca.gov/dataset/covid-19-time-series-metrics-by-county-and-state.

Calvert, S. (2020, November 28). Public Transit Agencies Slash Services, Staff as Coronavirus Keeps Ridership Low. *Wall Street Journal*. Retrieved January 28, 2022, from https://www.wsj.com/articles/public-transit-agencies-slash-services-staff-as-coronavirus-keeps-ridership-low-11606582853.

Cano, R. (2021, December 17). SFMTA's Budget Deficit Not as Large as Expected. Does This Mean a Return of Full Muni Service? *San Francisco Chronicle*. Retrieved January 28, 2022, from https://www.sfchronicle.com/sf/article/SFMTA-s-budget-deficit-not-as-large-as-16708742.php.

CBS SF (2021, October 29). BART Could Face Nine-figure Budget Deficits by 2024, Experts Say. *KPIX 5: CBS SF Bay Area*. Retrieved January 28, 2022, from https://sanfrancisco.cbslocal.com/2021/10/29/bart-could-face-9-figure-budget-deficits-by-2024-experts-say/.

CDTFA (2022, January). Monthly Payments to Special Districts from the Transactions (Sales) and Use Tax. *California Department of Tax and Fee Administration*. Retrieved February 8, 2022, from https://www.cdtfa.ca.gov/dataportal/dataset.htm?url=MonthlyLocalAllocationSpecialDistrict.

Cetoute, D. (2022, January 15). Some Bus Routes to Be Suspended, Changed Due to COVID-related Bus Driver Shortage. *Miami Herald*. Retrieved February 4, 2021, from https://www.miamiherald.com/news/coronavirus/article257350592.html.

Chan, H., Skali, A., Savage, D., Stadelmann, D., and Torgler, B. (2020, November 16). Risk Attitudes and Human Mobility during the COVID-19 Pandemic. *Scientific Reports*, *10*(1). https://doi.org/10.1038/s41598-020-76763-2.

Cheung, C. (2022, January). *COO Oral Report: Super Bowl and Operations Service Update*. Presented at the LA Metro Board Operations, Safety, and Customer Experience Committee meeting, Los Angeles. Retrieved February 4, 2022, from http://metro.legistar1.com/metro/attachments/e9a5480a-f5f7-4ac7-a2e0-200513d0fa50.pdf.

Chiland, E. (2018, December 6). Metro CEO Supports Congestion Pricing, Free Fares on Public Transit: Could Tolls on Drivers Cut Down on Traffic? *Curbed Los Angeles*. Retrieved January 31, 2022, from https://la.curbed.com/2018/12/6/18129258/congestion-pricing-free-fares-metro-los-angeles.

Choi, R. (2012, March 20). *Memorandum of Understanding between the City of Burbank and the Los Angeles County Metropolitan Transportation Authority to Receive Proposition A Growth over Inflation Grant Funds* [memorandum to M. Flad]. Retrieved February 10, 2022, from https://burbank.granicus.com/MetaViewer.php?view_id=6&clip_id=4473&meta_id=139765.

Circella, G. (2020, September). *The COVID-19 Pandemic: What Does It Mean for Mobility? What [Are] the Temporary vs. Longer-term Impacts?* Presented at the SCAG Modeling Task Force. Retrieved February 10, 2022, from https://scag.ca.gov/sites/main/files/file-attachments/mtf092320_circella.pdf.

Cohen, J. (2020, September 4). As Some New Yorkers Flee, Others Move Closer to the Office: For Workers Who Are Required to Be On-site, Fear of Public Transportation Has Spurred a Wave of Demand for Homes within Walking Distance of Their Jobs. *New York Times*. Retrieved January 24, 2022, from https://www.nytimes.com/2020/09/04/realestate/nyc-office-move-closer.html.

Cowan, J. (2021, June 15). A Timeline of the Coronavirus in California Tuesday: As California Reopens, Here's a Look Back at What the State Has Endured. *New York Times*. Retrieved February 8, 2022, from https://www.nytimes.com/2021/06/15/us/coronavirus-california-timeline.html.

Crabbe, A., Hiatt, R., Poliwka, S., and Wachs, M. (2005, October). Local Transportation Sales Taxes: California's Experiment in Transportation Finance. *Public Budgeting and Finance*, *25*(3), 91–121. https://doi.org/10.1111/j.1540-5850.2005.00369.x.

Crowe, C. (2021, March 31). Boston Pilots Free Public Transit in Bid for Equitable COVID Recovery. *Smart Cities Dive*. Retrieved January 28, 2022, from https://www.smartcitiesdive.com/news/boston-pilots-free-public-transit-MBTA-equitable-covid-recovery/597584/.

Crowell and Moring (2021, November 8). Congress Passes $1 Trillion Bipartisan Infrastructure Bill: What Is in It? *Crowell*. Retrieved February 15, 2022, from https://www.crowell.com/NewsEvents/AlertsNewsletters/all/Congress-Passes-1-Trillion-Bipartisan-Infrastructure-Bill-What-is-In-It.

Dadayan, L. (2020, July 1). COVID-19 Pandemic Could Slash 2020-21 State Revenues by $200 Billion. *Tax Policy Center: Urban Institute and Brookings Institution*. Retrieved June 29, 2021, from https://www.taxpolicycenter.org/taxvox/covid-19-pandemic-could-slash-2020-21-state-revenues-200-billion.

Dai, T., and Taylor, B. (2020, October 1). *When is Public Transit Too Crowded, and How Has This Changed during the Pandemic?* (UC ITS-2021-12). UCLA ITS. https://doi.org/10.17610/T60S34.

Dasmalchi, E. (2020, October 1). *Using Real-time Crowding Data as a Rider Communication Strategy in the COVID-19 Pandemic* (UC ITS-2021-12). UCLA ITS. https://doi.org/10.17610/T6W02W.

de la Garza, A. (2020, July 21). COVID-19 Has Been "Apocalyptic" for Public Transit. Will Congress Offer More Help? *Time*. Retrieved January 23, 2022, from https://time.com/5869375/public-transit-coronavirus-covid/.

Descant, S. (2021, August 24). Can America's COVID-battered Commuter Rail Make a Comeback?: Ridership on Commuter Rail Declined as Much as 90 Percent for Some Services during the COVID-19 Pandemic. Operators Are Now Exploring Options to Bring Back Not Only Riders Who Sat Out the Pandemic, but New Customers as Well. *GovTech*. Retrieved February 15, 2022, from https://www.govtech.com/fs/can-americas-covid-battered-commuter-rail-make-a-comeback.

Dickens, M. (2021, May). *2021 Public Transportation Fact Book*. American Public Transportation Association. Retrieved February 11, 2022, from https://www.apta.com/research-technical-resources/transit-statistics/public-transportation-fact-book/.

Ding, H., and Taylor, B. (2021, September 1). *Making Transit Safe to Ride during a Pandemic: What Are the Risks and What Can Be Done in Response?* UCLA ITS. Retrieved January 20, 2022, from https://escholarship.org/uc/item/2zh811x8.

Dolven, T. (2021, September 16). With Ridership Way Down, MBTA Faces "Fiscal Calamity," Top Watchdog Warns. *Boston Globe*. Retrieved January 28, 2022, from https://www.bostonglobe.com/2021/09/16/metro/fiscal-calamity-top-watchdog-warns-t-faces-existential-threat-financial-shortfall/.

Duncan, I. (2022, January 4). Metro Reduces Bus Service as It Faces Wave of Coronavirus Infections: The Transit Agency's Bus Schedule Will Be about 75 Percent of Normal, Metro Said. *Washington Post*. Retrieved February 4, 2022, from https://www.washingtonpost.com/transportation/2022/01/04/metro-bus-schedule-reduction-covid/.

Dunning, R., and Nurse, A. (2021, March 1). The Surprising Availability of Cycling and Walking Infrastructure through COVID-19. *Town Planning Review*, *92*(2), 149–156. https://doi.org/10.3828/tpr.2020.35.

EBP U.S. (2020, May 5). *The Impact of the COVID-19 Pandemic on Public Transit Funding Needs in the U.S.* American Public Transportation Association. Retrieved February 14, 2022, from https://apta.com/wp-content/uploads/APTA-COVID-19-Funding-Impact-2020-05-05.pdf.

Ehsani, J., Michael, J., Duren, M., Mui, Y., and Porter, K. (2021, June 1). Mobility Patterns before, during, and Anticipated after the COVID-19 Pandemic: An Opportunity to Nurture Bicycling. *American Journal of Preventive Medicine*, *60*(6), e277–e279. https://doi.org/10.1016/j.amepre.2021.01.011.

FHWA (2021, October 26). Table HM-71—Highway Statistics 2020. *U.S. Department of Transportation Federal Highway Administration*. Retrieved February 10, 2022, from https://www.fhwa.dot.gov/policyinformation/statistics/2020/hm71.cfm.

FHWA (2022, February 10). Bipartisan Infrastructure Law. *U.S. Department of Transportation Federal Highway Administration*. Retrieved February 15, 2022, from https://www.fhwa.dot.gov/bipartisan-infrastructure-law/.

Fink, C. (2012). *More Than Just the "Loser Cruiser"?: An Ethnographic Study of the Social Life on Buses* (PhD diss.). UCLA, Los Angeles. Retrieved February 15, 2022, from https://escholarship.org/uc/item/75z3t252.

Fitzgerald, T. (2021, November 17). The Infrastructure Bill Is Big, but It Won't Transform America's Focus on Cars: The Bill Contains $110 Billion in New Spending for Highways, Roads, and Bridges, Compared to $39 Billion on Public Transit—Close to the Usual Ratio. *Philadelphia Inquirer*. Retrieved February 15, 2022, from https://www.inquirer.com/transportation/bipartisan-infrastructure-bill-roads-bridges-spending-20211117.html.

Fonseca, R. (2021, May 5). LA Metro Is Restoring Service to Pre-pandemic Levels and Wants to Hire 800 New Bus Drivers to Get There. *LAist*. Retrieved February 5, 2022, from https://laist.com/news/transportation/la-metro-hiring-800-bus-drivers-pandemic-public-transit.

Fonseca, R. (2022, February 1). LA Metro Is Cutting Service Again as It Struggles to Hire (and Keep) Bus Operators. *LAist*. Retrieved February 4, 2022, from https://laist.com/news/transportation/la-metro-service-cuts-bus-operator-shortage.

Foothill Transit (2021, June). *Business Plan and Budget FY2022* (Adopted). Foothill Transit. Retrieved January 26, 2022, from http://foothilltransit.org/wp-content/uploads/2021/06/BusinessPlan-2021_AdoptedWeb.pdf.

Foothill Transit (2022). Organization. *Foothill Transit*. Retrieved February 7, 2022, from http://foothilltransit.org/about/organization/.

Fraade, J., and Speroni, S. (2019, July 17). Local Option Sales Taxes. *TransitWiki*. Retrieved June 29, 2021, from https://www.transitwiki.org/TransitWiki/index.php/Local_option_sales_taxes.

Frick, K., Kumar, T., and Post, A. (2020, July 1). *The General Transit Feed Specification (GTFS) Makes Trip-planning Easier—Especially During a Pandemic—Yet Its Use by California Agencies Is Uneven*. UC Berkeley ITS. https://doi.org/10.7922/G2ZG6QJZ.

FTA (2021a, March). *American Rescue Plan Act of 2021*. Federal Transit Administration. Retrieved February 7, 2022, from https://www.transit.dot.gov/sites/fta.dot.gov/files/2021-03/American-Rescue-Plan-Act-Fact-Sheet.pdf.

FTA (2021b). The National Transit Database (NTD). *Federal Transit Administration*. Retrieved January 21, 2022, from https://www.transit.dot.gov/ntd.

FTA (2021c, February 19). Coronavirus Aid, Relief, and Economic Security (CARES) Act. *Federal Transit Administration*. Retrieved February 7, 2022, from https://www.transit.dot.gov/cares-act.

FTA (2021d, May). *An Overview of the American Rescue Plan (ARP) Act and an Update on FTA's Furlough Guidance*. Retrieved February 7, 2022, from https://www.transit.dot.gov/sites/fta.dot.gov/files/2021-05/Overview-of-the-American-Rescue-Plan-Act-Webinar-05-05-2021.pdf.

FTA (2021e, June 3). Urbanized Areas in Region 9. *Federal Transit Administration*. Retrieved February 8, 2022, from https://www.transit.dot.gov/region9/uza.

FTA (2021f, July 27). Frequently Asked Questions from FTA Grantees Regarding Coronavirus Disease 2019 (COVID-19). *Federal Transit Administration*. Retrieved February 7, 2022, from https://www.transit.dot.gov/frequently-asked-questions-fta-grantees-regarding-coronavirus-disease-2019-covid-19.

FTA (2021g, August 24). Coronavirus Response and Relief Supplemental Appropriations Act of 2021. *Federal Transit Administration*. Retrieved February 7, 2022, from https://www.transit.dot.gov/funding/grants/coronavirus-response-and-relief-supplemental-appropriations-act-2021.

FTA (2022a, January). *Building Better Transit*. Presented at the External Stakeholder Bipartisan Infrastructure Law Webinar. Retrieved February 15, 2022, from https://www.transit.dot.gov/sites/fta.dot.gov/files/2022-01/FTA-BIL-Implementation-Webinar-Presentation-01-07-2022.pdf.

FTA (2022b, February 11). Bipartisan Infrastructure Law. *Federal Transit Administration*. Retrieved February 15, 2022, from https://www.transit.dot.gov/BIL.

FTA (n.d.-a). May an Individual Be Charged a Higher Fee for Complementary Paratransit than They Would Pay on Fixed Route? *Federal Transit Administration*. Retrieved January 31, 2022, from https://www.transit.dot.gov/may-individual-be-charged-higher-fee-complementary-paratransit-they-would-pay-fixed-route.

FTA (n.d.-b). Urbanized Area Formula Grants—5307. *Federal Transit Administration*. Retrieved February 7, 2022, from https://www.transit.dot.gov/funding/grants/urbanized-area-formula-grants-5307.

Fung, H. (2022, February 4). *Feb. 2022 Metro CAC Chair Fung's Report* (Attachment D). LA Metro Community Advisory Council Executive Committee. Retrieved February 4, 2022, from https://www.dropbox.com/s/277bqf0km1ce17a/2022-0204-cac-agendapacket.pdf.

Furth, S. (2020, April 19). Automobiles Seeded the Massive Coronavirus Epidemic in New York City. *Market Urbanism*. Retrieved February 10, 2022, from https://marketurbanism.com/2020/04/19/automobiles-seeded-the-massive-coronavirus-epidemic-in-new-york-city/.

George, J. (2021a, February 11). Metro Board Expresses Wariness over Increased Debt but Gives Tentative Approval. *Washington Post*. Retrieved January 28, 2022, from https://www.washingtonpost.com/local/trafficandcommuting/metro-budget-debt/2021/02/11/93c0e4a8-6c97-11eb-9f80-3d7646ce1bc0_story.html.

George, J. (2021b, December 23). Bus Operator Shortage Due to COVID Prompts Metro to Reduce Bus Service: Transit Agency Said Infections among Employees Have Skyrocketed, Going from 18 to 100 in Two Weeks. *Washington Post*. Retrieved February 4, 2022, from https://www.washingtonpost.com/transportation/2021/12/23/dc-metro-bus-shortage-covid/.

George, J. (2022, January 15). Omicron Deepens Bus Driver Shortage, Frustrating Passengers as Transit Agencies Pare Back Service: The Fast-spreading Variant Has Thrown Transit Agencies into Crisis as They Try to Fill Shifts and Keep Routes Operating. *Washington Post*. Retrieved January 19, 2022, from https://www.washingtonpost.com/transportation/2022/01/15/covid-omicron-bus-transit/.

Goldbaum, C. (2020a, November 18). Subway Service Could Be Cut 40% If No Federal Aid Arrives: On Wednesday, Transit Officials Announced Some New Details of Proposed Service Cuts, Including Slashing Weekend Service and Eliminating Bus Lines, to Address Its Multibillion-dollar Budget Hole. *New York Times*. Retrieved January 28, 2022, from https://www.nytimes.com/2020/11/18/nyregion/nyc-mta-budget-cuts.html.

Goldbaum, C. (2020b, December 16). Counting on Biden, M.T.A. Shifts from Doomsday Budget to a Wishful One: New York's Transportation Agency Is Expected to Pass a Stopgap Budget That Omits the Draconian Cuts Transit Officials Have Threatened in Recent Months. *New York Times*. Retrieved January 28, 2022, from https://www.nytimes.com/2020/12/16/nyregion/mta-budget-cuts-federal-aid.html.

Goldbaum, C., and Wright, W. (2020, December 6). “Existential Peril”: Mass Transit Faces Huge Service Cuts across U.S.: Reeling from the Pandemic, Transit Agencies Are Grappling with Drastic Reductions in Ridership and Pleading for Help from Washington. *New York Times*. Retrieved January 28, 2022, from https://www.nytimes.com/2020/12/06/nyregion/mass-transit-service-cuts-covid.html.

Goldman, T., and Wachs, M. (2003, Winter). A Quiet Revolution in Transportation Finance: The Rise of Local Option Transportation Taxes. *Transportation Quarterly*, *57*(1), 19–32. Retrieved June 29, 2021, from https://escholarship.org/uc/item/2gp4m4xq.

Gordon, W. (2021, November 19). What’s Behind the Bus Driver Shortage? *Virginia Mercury*. Retrieved February 4, 2022, from https://www.virginiamercury.com/2021/11/19/whats-behind-the-bus-driver-shortage/.

Haag, M., and McGeehan, P. (2022, January 21). How Remote Work Is Devastating New York City’s Commuter Rails: Before the Pandemic, They Relied on Office Workers, Who Spent up to $500 a Month on Tickets. at the M.T.A., Those Sales Are down 75 Percent. *New York Times*. Retrieved February 15, 2022, from https://www.nytimes.com/2022/01/21/nyregion/nyc-commuter-rail-pandemic.html.

Harris, J. (2020, April 24). *The Subways Seeded the Massive Coronavirus Epidemic in New York City*. MIT. Retrieved January 20, 2022, from https://web.mit.edu/jeffrey/harris/HarrisJE_WP2_COVID19_NYC_24-Apr-2020.pdf.

Hess, D., and Lombardi, P. (2005, October 1). Governmental Subsidies for Public Transit: History, Current Issues, and Recent Evidence. *Public Works Management and Policy*, *10*(2), 138–156. https://doi.org/10.1177/1087724X05284965.

Hoffman, J., Hirano, M., Panpradist, N., Breda, J., Ruth, P., Xu, Y., Lester, J., Nguyen, B., Ceze, L., and Patel, S. (2022, January 8). Passively Sensing SARS-CoV-2 RNA in Public Transit Buses. *Science of the Total Environment*. https://doi.org/10.1016/j.scitotenv.2021.152790.

Howland, R., Cowan, N., Wang, S., Moss, M., and Glied, S. (2020, December 1). Public Transportation and Transmission of Viral Respiratory Disease: Evidence from Influenza Deaths in 121 Cities in the United States. *PLOS ONE*, *15*(12). https://doi.org/10.1371/journal.pone.0242990.

Hymon, S. (2020a, December 24). Metro Answers Rider Questions and Concerns About Recent NextGen Bus Service Changes, COVID-19 and Crowding. *The Source*. Retrieved February 11, 2022, from https://thesource.metro.net/2020/12/24/metro-answers-rider-questions-and-concerns-about-recent-nextgen-bus-service-changes-and-crowding/.

Hymon, S. (2020b, December 31). 2020 in Review: A Year Like No Other for Metro. *The Source*. Retrieved February 5, 2022, from https://thesource.metro.net/2020/12/31/2020-in-review-a-year-like-no-other-for-metro/.

Ionescu, D. (2022, February 2). New York’s Commuter Rail Ridership May Never Reach Pre-pandemic Levels: Shifting Commute Patterns and the Popularity of Remote Work Could Pose an Existential Threat to the New York City Region’s Commuter Rail Services. *Planetizen*. Retrieved February 15, 2022, from https://www.planetizen.com/news/2022/02/116067-new-yorks-commuter-rail-ridership-may-never-reach-pre-pandemic-levels.

Jones, D. (1985). *Urban Public Transit: An Economic and Political History*. Englewood Cliffs, NJ: Prentice Hall.

Kamal, S. (2022, January 25). Transit Worker Shortage Ripples through California Economy. *CalMatters*. Retrieved February 4, 2022, from http://calmatters.org/economy/labor/2022/01/transit-worker-shortage-california/.

Kamga, C., and Eickemeyer, P. (2021, June 1). Slowing the Spread of COVID-19: Review of "Social Distancing" Interventions Deployed by Public Transit in the United States and Canada. *Transport Policy*, *106*, 25–36. https://doi.org/10.1016/j.tranpol.2021.03.014.

Kamisher, E. (2021, December 29). Bay Area Transit Looks to Woo New Bus Operators Amid National Driver Shortage: Faced with Staffing Shortages Bay Area Transit Agencies Are Looking to Hire New Recruits. But They Face an Uphill Battle. *Mercury News*. Retrieved January 19, 2022, from https://www.mercurynews.com/2021/12/29/bay-area-transit-looks-to-woo-new-bus-operators-amid-national-driver-shortage/.

Kamisher, E. (2022, February 8). Omicron Worsened BART Ridership Recovery, Fiscal Woes—and Taxpayers May Be Asked to Pay for It: New Report Forecasts 30% of Pre-COVID Riders Won't Come Back. *Mercury News*. Retrieved February 14, 2022, from https://www.mercurynews.com/2022/02/08/omicron-worsened-bart-ridership-recovery-fiscal-woes-and-taxpayers-may-be-asked-to-pay-for-it.

Kim, C., Cheon, S., Choi, K., Joh, C., and Lee, H. (2017, November 1). Exposure to Fear: Changes in Travel Behavior During MERS Outbreak in Seoul. *Korean Society of Civil Engineers Journal of Civil Engineering*, *21*(7), 2888–2895. https://doi.org/10.1007/s12205-017-0821-5.

King, H., Amberg, N., Wasserman, J., Taylor, B., and Wachs, M. (2021, August 25). *All Is Not LOST: Tracking California's Local Option Sales Tax Revenues for Transportation during the Pandemic* (UC-ITS-2021-18). UCLA ITS. https://doi.org/10.17610/T6SW39.

King, H., Amberg, N., Wasserman, J., Taylor, B., and Wachs, M. (forthcoming). LOST and Found: The Fall and Rise of Local Option Sales Taxes for Transportation in California amidst the Pandemic. In A. Loukaitou-Sideris, A. Bayen, G. Circella, and R. Jayakrishnan (Eds.), *Pandemic in the Metropolis: Transportation Impacts and Recovery*. Springer.

KOB-TV (2021, September 20). Albuquerque Will Eliminate Bus Fares for Riders in 2022. *KOB 4*. Retrieved January 28, 2022, from https://www.kob.com/albuquerque-news/albuquerque-will-eliminate-bus-fares-for-riders-in-2022/6244103/.

LA Metro (2020a). We Are Here for You. Retrieved February 10, 2022, from https://web.archive.org/web/20200810082047/https://www.metro.net/riding/here-for-you/.

LA Metro (2020b, April 2). STAY HOME. Stop the Spread. *Twitter*. Retrieved February 10, 2022, from https://twitter.com/metrolosangeles/status/1245855859566981120.

LA Metro (2020c, May). *COVID-19 Loss and Mitigation: Metro Board of Director Update*. Retrieved February 10, 2022, from http://metro.legistar1.com/metro/attachments/d969624a-ff0b-46da-8891-6898b1512ead.pdf.

LA Metro (2021, October 11). Metro Experiencing Some Service Impacts Due to Staff Shortages. *The Source*. Retrieved January 23, 2022, from https://thesource.metro.net/2021/10/11/metro-experiencing-some-service-impacts-due-to-staff-shortages/.

LA Metro (2022a). Low-Income Fare is Easy (LIFE). *LA Metro*. Retrieved February 5, 2022, from https://www.metro.net/riding/life/.

LA Metro (2022b). Metro System Maps. *LA Metro*. Retrieved February 10, 2022, from https://www.metro.net/riding/guide/system-maps/.

LA Metro and City of Burbank (2012, March 20). *Memorandum of Understanding: Proposition A Growth over Inflation Grant Funds* (MOU.PA11BUR). LA Metro and City of Burbank. Retrieved February 10, 2022, from https://burbank.granicus.com/MetaViewer.php?view_id=6&clip_id=4473&meta_id=139766.

LA Metro staffer (2021, December 22). *Stimulus Allocations by Operator* [personal communication to authors].

Lazo, L. (2021a, January 16). Ten Months into the Pandemic, Transit Systems in the Washington Suburbs Have a Long Way to Normal. *Washington Post*. Retrieved January 25, 2022, from https://www.washingtonpost.com/local/trafficandcommuting/washington-transit-systems/2021/01/15/39f8ff16-5039-11eb-83e3-322644d82356_story.html.

Lazo, L. (2021b, November 12). Bus Systems Are Eyeing Lower Fares, Leaving Passengers and Advocates to Wonder at What Cost. *Washington Post*. Retrieved February 10, 2022, from https://www.washingtonpost.com/transportation/2021/11/12/washington-bus-free-fares-equity/.

Lederman, J., Brown, A., Taylor, B., and Wachs, M. (2018, December 1). Lessons Learned from 40 Years of Local Option Transportation Sales Taxes in California. *Transportation Research Record: Journal of the Transportation Research Board*, *2672*(4), 13–22. https://doi.org/10.1177/0361198118782757.

Lederman, J., Kellogg, S., Haas, P., Wachs, M., and Agrawal, A. (2021, February). *Do Equity and Accountability Get Lost in LOSTs?: An Analysis of Local Return Funding Provisions in California's Local Option Sales Tax Measures for Transportation* (Project 1811). Mineta Transportation Institute. https://doi.org/10.31979/mti.2021.1811.

Levy, A. (2020, April 17). That MIT Study about the Subway Causing COVID Spread is Crap. *Streetsblog New York City*. Retrieved February 10, 2022, from https://nyc.streetsblog.org/2020/04/17/that-mit-study-about-the-subway-causing-covid-spread-is-crap/.

Linton, J. (2021a, January 22). Metro FY21 Mid-year Budget Adjustment: More Money than Expected, but None to Restore Cut Transit Service. *Streetsblog Los Angeles*. Retrieved January 28, 2022, from https://la.streetsblog.org/2021/01/21/metro-fy21-mid-year-budget-adjustment-more-money-than-expected-but-none-to-restore-cut-transit-service/.

Linton, J. (2021b, January 29). Metro Board Restores $24.3 Million in Cut Transit Service. *Streetsblog Los Angeles*. Retrieved January 28, 2022, from https://la.streetsblog.org/2021/01/28/metro-board-restores-24-3-million-in-cut-transit-service/.

Linton, J. (2021c, December 23). Metro's Student Fareless Pilot Gathering Momentum a Couple Months In. *Streetsblog Los Angeles*. Retrieved February 5, 2022, from https://la.streetsblog.org/2021/12/23/metros-student-fareless-pilot-gathering-momentum-a-couple-months-in/.

Linton, J. (2022a, January 21). Metro Transit Operations in Crisis, Staff Recommends Ten+ Percent Temporary Service Cut. *Streetsblog Los Angeles*. Retrieved February 4, 2022, from https://la.streetsblog.org/2022/01/20/metro-transit-operations-in-crisis-staff-recommends-10-percent-temporary-service-cut/.

Linton, J. (2022b, January 25). Metro Operations Update: Operator Pay Raise, Another Motion to Restore Service Later. *Streetsblog Los Angeles*. Retrieved February 4, 2022, from https://la.streetsblog.org/2022/01/25/metro-operations-update-operator-pay-raise-another-motion-to-restore-service-later/.

Little, J. (2022, January 7). Bus-driver Shortages Force MTS to Reduce Frequency on Some Routes: MTS Being Forced to Reduce Number of Buses on Some Routes That Take People to Work or School. *NBC 7 San Diego*. Retrieved January 19, 2022, from https://www.nbcsandiego.com/news/coronavirus/bus-driver-shortages-force-mts-to-reduce-frequency-on-some-routes/2833912/.

Liu, L., Miller, H., and Scheff, J. (2020, November 18). The Impacts of COVID-19 Pandemic on Public Transit Demand in the United States. *PLOS ONE*, *15*(11). https://doi.org/10.1371/journal.pone.0242476.

Loukaitou-Sideris, A., Wasserman, J., Caro, R., and Ding, H. (2020, December 17). *Homelessness in Transit Environments: Volume I, Findings from a Survey of Public Transit Operators* (UC-ITS-2021-13). UCLA ITS. https://doi.org/10.17610/T6V317.

Mallett, W., and Goldman, B. (2020, March 30). *Public Transportation and Amtrak Funding in the CARES Act (P.L. 116-136)* (IN11293). Congressional Research Service. Retrieved January 28, 2022, from https://crsreports.congress.gov/product/pdf/IN/IN11293.

Manville, M., Taylor, B., and Blumenberg, E. (2018, January). *Falling Transit Ridership: California and Southern California*. UCLA ITS. https://doi.org/10.17610/T6WP4J.

Marcantonio, R. (2021, February 17). Silicon Valley Bus Drivers Restored Community Rides for Free—By Taking Matters into Their Own Hands. *Labor Notes*. Retrieved January 20, 2022, from https://labornotes.org/2021/02/silicon-valley-bus-drivers-restored-community-rides-free-taking-matters-their-own-hands.

Mass Transit (2021, January 6). L.A. Metro Experiencing Staff Shortages, Canceled Trips Due to Regional Surge in COVID-19 Cases. *Mass Transit*. Retrieved January 23, 2022, from https://www.masstransitmag.com/management/press-release/21204848/los-angeles-county-metropolitan-transportation-authority-metro-la-metro-experiencing-staff-shortages-canceled-trips-due-to-regional-surge-in-covid19-cases.

Matute, J., Wickland, T., Bains, J., Taylor, B., Toda, R., Huff, H., O'Brien, R., Gahbauer, J., and Ye, C. (2017, March). *California Statewide Transit Strategic Plan: Baselines Report* (Caltrans Contract #74A0884). UCLA ITS. Retrieved February 14, 2021, from https://dot.ca.gov/-/media/dot-media/programs/rail-mass-transportation/documents/f0009862-stsp2017baselinefinal-a11y.pdf.

McArdle, M. (2022, February 13). Cities Aren't Facing Up to Their "Long COVID" Crisis: Downtown Is in Deep Trouble. *Washington Post*. Retrieved February 15, 2022, from https://www.washingtonpost.com/opinions/2022/02/13/cities-arent-facing-up-their-long-covid-crisis-downtown-is-deep-trouble/.

Metrolink (2016, December). *Metrolink Is the Best Investment to Reduce Freeway Traffic and Clean the Air in Southern California.* Metrolink. Retrieved January 26, 2022, from https://metrolinktrains.com/globalassets/about/mtl544_infographics-handoutm3bhno-bleeds-or-cropmarks.pdf.

Metrolink (2021, January 22). *Strategic Business Plan*. Metrolink. Retrieved February 9, 2022, from https://metrolinktrains.com/globalassets/about/agency/strategic-plan/metrolink-strategic-plan-final---full-report--r.pdf.

Michael Fajans and Associates (2006, November). *Transportation Development Plan: 2006-2015*. Santa Clarita Transit. Retrieved February 10, 2022, from https://filecenter.santa-clarita.com/transit/sctransitTDP%20FINAL%20Doc%2011-30-06_Reduced.pdf.

Muley, D., Shahin, M., Dias, C., and Abdullah, M. (2020, January). Role of Transport during Outbreak of Infectious Diseases: Evidence from the Past. *Sustainability*, *12*(18). https://doi.org/10.3390/su12187367.

Mutikani, L. (2021, April 30). Stimulus Checks Boost U.S. Consumer Spending; Inflation Warming Up. *Reuters*. Retrieved February 8, 2022, from https://www.reuters.com/business/us-consumer-spending-income-rebound-march-2021-04-30/.

NJ Transit (2022). VAXRIDE. *NJ Transit*. Retrieved February 10, 2022, from https://www.njtransit.com/vaxride.

OCTA (2022, February 4). Rider Alerts. Retrieved February 4, 2022, from https://www.octa.net/Bus/Riders-Alerts/Overview/.

OCTA staffer (2021, October 20). *Stimulus Allocations by Operator* [personal communication to authors].

Pasadena Transit (2019, April). *Pasadena Short Range Transit Plan*. City of Pasadena. Retrieved February 10, 2022, from https://www.cityofpasadena.net/pasadena-transit/wp-content/uploads/sites/19/SRTP-1.pdf.

Paul, J., and Taylor, B. (2022). Pandemic Transit: Examining Transit Use Changes and Equity Implications in Boston, Houston, and Los Angeles. Presented at the 101st Annual Meeting of the Transportation Research Board, Washington, D.C.

Pignataro, A. (2019, June 18). An Orange County Streetcar Named Displacement. *OC Weekly*. Retrieved January 25, 2022, from https://www.ocweekly.com/an-orange-county-streetcar-named-displacement/.

Pilla, S. (2021, December 11). Metro Looking to Hire 500 Bus Operators amid Labor Shortage. Retrieved January 24, 2022, from https://spectrumnews1.com/ca/la-west/business/2021/12/12/metro-looking-to-hire-500-bus-operators-amid-labor-shortage.

PVTA (2021, September 8). *Pomona Valley Transportation Authority: Wednesday, September 8, 2021 Regular Board of Directors Meeting Minutes* (Agenda Item #2A). PVTA. Retrieved February 10, 2022, from https://www.pvtrans.org/wp-content/uploads/2021/11/Consent-Calendar.pdf.

RCTC staffer (2021, October 19). *Stimulus Allocations by Operator* [personal communication to authors].

Rosalsky, G. (2022, January 25). The Great Resignation? More like The Great Renegotiation. *NPR*. Retrieved February 4, 2022, from https://www.npr.org/sections/money/2022/01/25/1075115539/the-great-resignation-more-like-the-great-renegotiation.

Rosenberg, E. (2021, December 28). Labor Shortages Are Hampering Public Transportation Systems, Challenging the Recovery of City Life. *Washington Post*. Retrieved January 23, 2022, from https://www.washingtonpost.com/business/2021/12/28/worker-shortages-public-transportation/.

Saha, N., Quadir, M., and Godavarthy, R. P. (2021, August 6). Risk of COVID-19 Spread and Mitigation Strategies in Public Transportation Sector. *Journal of Transportation Technologies*, *11*(4), 504–518. https://doi.org/10.4236/jtts.2021.114032.

Salazar, N. (2021, January 2). Existential vs. Essential Mobilities: Insights from before, during and after a Crisis. *Mobilities*, *16*(1), 20–34. https://doi.org/10.1080/17450101.2020.1866320.

Sam Schwartz Consulting (2020, September). *Public Transit and COVID-19 Pandemic: Global Research and Best Practices*. American Public Transportation Association. Retrieved February 10, 2022, from https://www.apta.com/wp-content/uploads/APTA_Covid_Best_Practices_09.29.2020.pdf.

Sanquinetti, A., DePew, A., Hirschfelt, K., Ross, C., Khoe, E., and Ferguson, B. (2021, September 1). *Practitioner Guide: An Inventory of Vehicle Design Strategies Aimed at Reducing COVID-19 Transmission in Public and Private Pooled and Shared Transportation* (UC-ITS-2020-06b). UC Davis ITS. https://doi.org/10.7922/G23X84XB.

Saphores, J., Shah, D., and Khatun, F. (2020, January 22). *A Review of Reduced and Free Transit Fare Programs in California* (UC-ITS-2019-55). UC Irvine ITS. https://doi.org/10.7922/G2XP735Q.

Savage, N. (2022, January 17). A Shortage of Bus Drivers Is Causing Problems for Those Who Use Public Transportation. In M. Kelly (Host), *All Things Considered*. NPR. Retrieved January 19, 2022, from https://www.npr.org/2022/01/17/1073661319/a-shortage-of-bus-drivers-is-causing-problems-for-those-who-use-public-transport.

SBCTA staffer (2021, October 26). *Stimulus Allocations by Operator* [personal communication to authors].

SCAG Transportation Committee (2021, April 1). *Transportation Committee: Thursday, April 1, 2021*. Southern California Association of Governments. Retrieved February 8, 2022, from https://scag.ca.gov/sites/main/files/file-attachments/tc040121fullpacket.pdf.

Scauzillo, S. (2021, April 16). Metro in La County Is Hiring 800 Drivers, Other Transit Agencies Increasing Staff. *Daily Bulletin*. Retrieved January 24, 2022, from https://www.dailybulletin.com/2021/04/16/metro-in-la-county-is-hiring-800-drivers-other-transit-agencies-increasing-staff.

Seider, J., Chagla, R., Farooqi, N., Makroo, A., Roberts, N., Raghani, D., Baltzer, R., Kumar, S., Chagla, A., and Hussain, S. (2020, April 2). *COVID-19 Transit Operations: Public Transit Responses to Coronavirus Situation*. WSP. Retrieved January 20, 2022, from https://www.rtd-denver.com/sites/default/files/files/2020-04/WSP%20Covid-19%20Plan%204-2-20.pdf.

Sengupta, S., and Plumer, B. (2020, June 26). How Cities Are Trying to Avert Gridlock after Coronavirus Lockdowns: Officials Are Trying to Prevent a Return to Urban Gridlock and Pollution as Residents Begin to Travel Again. *New York Times*. Retrieved February 14, 2022, from https://www.nytimes.com/2020/06/26/climate/cities-cars-traffic-congestion.html.

Smith, H. (2020, November 3). Metro Offers Free Bus, Rail and Bike Fares on Election Day. *Los Angeles Times*. Retrieved January 28, 2022, from https://www.latimes.com/california/story/2020-11-03/metro-offers-free-bus-rail-and-bike-fares-on-election-day.

Sparks, G. (2022, January 12). *Alliance of Local Transit Operators* [board meeting agenda item to PVTA]. Retrieved February 10, 2022, from https://www.pvtrans.org/wp-content/uploads/2022/01/Item-5.pdf.

Speroni, S., Taylor, B., and Hwang, Y. (forthcoming). Pandemic Transit: A National Look at the Shock, Adaptation, and Prospects for Recovery. In A. Loukaitou-Sideris, A. Bayen, G. Circella, and R. Jayakrishnan (Eds.), *Pandemic in the Metropolis: Transportation Impacts and Recovery*. Springer.

Tankersley, J. (2021, November 15). Biden Signs Infrastructure Bill, Promoting Benefits for Americans: Billions of Dollars Will Now Pour into American Communities, although the Final Package Falls Short of the President's Ambitions. *New York Times*. Retrieved February 15, 2022, from https://www.nytimes.com/2021/11/15/us/politics/biden-signs-infrastructure-bill.html.

Taylor, B. (2017). The Geography of Urban Transportation Finance. In G. Giuliano and S. Hanson (Eds.), *The Geography of Urban Transportation* (4th ed., pp. 247–272). New York City: Guilford.

Taylor, B., Blumenberg, E., Wasserman, J., Garrett, M., Schouten, A., King, H., Paul, J., and Ruvolo, M. (2020, June 29). *Transit Blues in the Golden State: Analyzing Recent California Ridership Trends* (UCLA ITS-LA1908). UCLA ITS. https://doi.org/10.17610/T67W2Z.

Taylor, B., and Morris, E. (2015, March 1). Public Transportation Objectives and Rider Demographics: Are Transit's Priorities Poor Public Policy? *Transportation*, *42*(2), 347–367. https://doi.org/10.1007/s11116-014-9547-0.

TransitCenter (2020a, March 24). Transit Is Essential: 2.8 Million U.S. Essential Workers Ride Transit to Their Jobs. *TransitCenter*. Retrieved February 11, 2022, from https://transitcenter.org/2-8-million-u-s-essential-workers-ride-transit-to-their-jobs/.

TransitCenter (2020b, April 7). Estimated Financial Impact of COVID-19 on U.S. Transit Agencies: $26-$40 Billion Annually. *TransitCenter*. Retrieved January 28, 2022, from https://transitcenter.org/estimated-financial-impact-of-covid-19-on-u-s-transit-agencies-26-38-billion-annually/.

TransitCenter (2020c, July 9). The CARES Act Came Up Short, Now Transit Agencies Are Running Out of Time. Retrieved February 7, 2022, from https://transitcenter.org/the-cares-act-came-up-short-now-transit-agencies-are-running-out-of-time/.

Uranga, R. (2022, January 28). Metro Slashes Bus and Rail Service Amid Driver Shortage. *Los Angeles Times*. Retrieved February 4, 2022, from https://www.latimes.com/california/story/2022-01-27/metro-slashes-bus-service-amid-driver-shortage.

U.S. Census Bureau (2010). 2010 Census Urban Area Reference Maps. *United States Census Bureau*. Retrieved February 8, 2022, from https://www.census.gov/geographies/reference-maps/2010/geo/2010-census-urban-areas.html.

U.S. Census Bureau (2020). U.S. Census. *Data.census.gov*. Retrieved February 7, 2022, from https://data.census.gov.

U.S. Census Bureau (2021, February 19). *Urban Areas for the 2020 Census—Proposed Criteria* (86 FR 10237). Federal Register. Retrieved February 8, 2022, from https://www.federalregister.gov/documents/2021/02/19/2021-03412/urban-areas-for-the-2020-census-proposed-criteria.

USDOT (2021, March 17). Fact Sheet: U.S. Department of Transportation Details the American Rescue Plan's Benefits for Transportation. *U.S. Department of Transportation*. Retrieved February 7, 2022, from https://www.transportation.gov/briefing-room/fact-sheet-us-department-transportation-details-american-rescue-plans-benefits.

VCTC staffer (2021, October 13). *Stimulus Allocations by Operator—Ventura County* [personal communication to authors].

Vock, D. (2020, December). Transit in Crisis. *Planning*, *86*(11), 21–22. Retrieved January 28, 2022, from https://www.planning.org/planning/2020/dec/transit-in-crisis/.

Wachs, M. (2009, Summer). After the Motor Fuel Tax: Reshaping Transportation Financing. *Issues in Science and Technology*, *25*(4). Retrieved June 28, 2021, from https://issues.org/wachs-2/.

Wachs, M., Marks, J., King, H., Lederman, J., and Guy, T. (2020, March). *Balancing Accountability and Flexibility in California's Local Option Sales Taxes* (PSR-18-33 TO-012). Pacific Southwest Region University Transportation Center. Retrieved February 8, 2022, from https://metrans.org/assets/research/psr-18-33_to-012_wachs_final-report.pdf.

Walker, A. (2022, January 19). L.A. Just Ran (and Ended) the Biggest Free-transit Experiment in the U.S. *Curbed*. Retrieved January 31, 2022, from https://www.curbed.com/2022/01/los-angeles-metro-free-transit-buses.html.

Walker, J. (2021, December 3). The Bus Driver Shortage is an Emergency. *Human Transit*. Retrieved January 19, 2022, from https://humantransit.org/2021/12/the-bus-driver-shortage-is-an-emergency.html.

Wanek-Libman, M. (2021, March 8). Senate Passes $1.9 Trillion American Rescue Plan, Including $30.5 Billion for Transit. *Mass Transit*. Retrieved February 7, 2022, from https://www.masstransitmag.com/management/article/21213146/senate-passes-19-trillion-american-rescue-plan-including-305-billion-for-transit.

Wang, D., Chonody, J., Krase, K., and Luzuriaga, L. (2021, January 1). Coping with and Adapting to COVID-19 in Rural United States and Canada. *Families in Society*, *102*(1), 78–90. https://doi.org/10.1177/1044389420960985.

Wang, L., and Wells, P. (2020, January). Automobilities after SARS-CoV-2: A Socio-technical Perspective. *Sustainability*, *12*(15). https://doi.org/10.3390/su12155978.

Wasserman, J., and Taylor, B. (2021, January 20). *Sources of and Gaps in Data for Understanding Public Transit Ridership* (UC-ITS-2020-33). UCLA ITS. https://doi.org/10.17610/t66893.

White House (2021, July 28). Fact Sheet: Historic Bipartisan Infrastructure Deal. *The White House*. Retrieved February 15, 2022, from https://www.whitehouse.gov/briefing-room/statements-releases/2021/07/28/fact-sheet-historic-bipartisan-infrastructure-deal/.

Ziegler, L. (2021, May 31). Everyone Gets a Seat on the Bus, for Free, as Kansas City Transit Returns to Full Capacity. *KCUR 89.3*. Retrieved January 28, 2022, from https://www.kcur.org/news/2021-05-31/everyone-gets-a-seat-on-the-bus-for-free-as-kansas-city-transit-returns-to-full-capacity.

UCLA Institute of Transportation Studies

3320 Public Affairs Building
Los Angeles, CA 90095-1656
uclaits@ucla.edu
its.ucla.edu