PUBLIC TRANSPORTATION MUST CHANGE AFTER COVID-19

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INTRODUCTION

COVID-19 will be remembered as a historic and transformational event impacting the human condition across the globe. Its consequences, direct and indirect, are likely to play out over many years as the human costs impact families, loved ones, and the economy, inclusive of dramatic additional government debt. COVID-19 has produced changes in behavior of individuals, businesses, and governments. Some share of these changes, initially in response to COVID-19, are now expected to remain long after COVID-19 has diminished as an overwhelming public health threat.

Public transportation is among those sectors disrupted by COVID-19 and unlikely to return to pre-COVID-19 conditions. The initial plummeting of ridership was associated with the shutdown of activities and due to exposure fears when using travel options that do not allow isolation or sufficient social distancing. The dramatic ridership reductions persisted as shutdowns were discontinued. Individuals who had to rely on public transportation returned but many others did not. Most public transportation trips remained lost as communication substituted for travel or commuters shifted to alternative modes, including newly acquired automobiles, that reduced exposure risk.

These ridership losses persist with unprecedented consequences. Extrapolating ridership trends from the National Transit Database through April 2021, which captures the first full year of COVID-19-impacted ridership, results in 12-month levels approximately 65% below
the 12-month period prior to the start of COVID-19. For the corresponding period, service levels are extrapolated to track approximately 23% below pre-COVID-19 levels.

While national data on spending and fare revenues for this period will not be available for months, Figure 1 shows the ridership trend since 2010 and Figure 2 shows the trend in revenue-miles of transit service. After March 2021, the rolling 12-month annual ridership should trend positive with the increase dependent on the pace of recovery in mitigating COVID-19 and the extent to which travelers return to transit.

**FIGURE 1: ANNUAL UNLINKED TRANSIT RIDERSHIP (ROLLING 12-MONTH TOTALS)**


**FIGURE 2: ANNUAL REVENUE VEHICLE-MILES OF SERVICE (ROLLING 12-MONTH TOTALS)**

FUNDING TRANSIT POST-COVID

EXPECTATIONS GIVEN CURRENT POLICIES

The financial implications of the graphed trends are highly dependent on the specific operating context. While fare revenues should generally track ridership, some transit agencies dropped fare collections to minimize risk, and the trip length distribution and fare category distribution (likely more travelers with discount fares) are likely to result in fares underperforming ridership levels. Similarly, operating costs are not likely tracking with the reductions in service levels as fixed operating costs and enhanced cleaning investments, and desires to sustain workforce compensation are likely to limit cost savings from lower service levels. These trends should be evaluated with financial data to determine the actual financial need of the industry.
Similarly, the financial health of the transit industry depends on the subsidy revenue streams that support operations. These include income, sales and property taxes, and occasionally revenue streams from other fees or general revenue sources at the local, regional, and state levels. Each of these sources is impacted differently depending on the specific revenue collection structure and economic conditions in the community. Property tax revenues, for example, are modestly if at all impacted by COVID-19 and many have risen.\(^1\) Sales tax revenues are affected by retail activity but are expected to recapture some of the forgone revenues as postponed purchases of things like vehicles and travel potentially surge in a recovery period.\(^2\)

Figure 3 shows the trend of federal funding going to public transportation inclusive of the American Rescue Plan that passed with a $30.5 billion commitment to public transportation. The original American Rescue Act proposal from the Biden administration included $20 billion for transit. The House raised it to $30 billion, then the Senate raised it to $30.5 billion. This is on top of the $15 billion in transit funding provided in the December COVID-19 Emergency Relief Act of 2020 and in addition to the $25 billion in CARES Act relief funding and the regular annual appropriation through the Federal Transit Administration. The national-level financial portrait of the public transportation industry is shown in Table 1.

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\(^2\) Ibid.
PUBLIC TRANSPORTATION MUST CHANGE AFTER COVID-19

FIGURE 3: POSSIBLE FEDERAL COMMITMENTS TO PUBLIC TRANSPORTATION, 2018-2021 (ASSUMING AMERICAN RESCUE ACT FUNDING)

TABLE 1: PUBLIC TRANSIT REVENUES IMPACTED BY COVID-19 (DOLLAR AMOUNTS IN MILLIONS)

<table>
<thead>
<tr>
<th>REVENUES</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>Adjustment for 2020</th>
<th>Adjustment for 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fares</td>
<td>$15,891</td>
<td>$16,070</td>
<td>$4,017</td>
<td>$5,624</td>
<td>-75%</td>
<td>-65%</td>
</tr>
<tr>
<td>Other Generated Revenue Excluding Fares</td>
<td>$5,365</td>
<td>$5,709</td>
<td>$2,855</td>
<td>$2,855</td>
<td>-50%</td>
<td>-50%</td>
</tr>
<tr>
<td>Local Funds</td>
<td>$24,987</td>
<td>$27,055</td>
<td>$22,997</td>
<td>$24,349</td>
<td>-15%</td>
<td>-10%</td>
</tr>
<tr>
<td>State Funds</td>
<td>$15,039</td>
<td>$18,046</td>
<td>$15,339</td>
<td>$16,242</td>
<td>-15%</td>
<td>-10%</td>
</tr>
<tr>
<td><strong>Total Revenues</strong></td>
<td>$73,313</td>
<td>$78,773</td>
<td>$83,158</td>
<td>$107,070</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Share from Federal Funds</strong></td>
<td>16.4%</td>
<td>15.1%</td>
<td>45.6%</td>
<td>54.2%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPENDITURES</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Expenditures</td>
<td>$51,764</td>
<td>$54,360</td>
<td>$46,206</td>
<td>$46,206</td>
<td>-15%</td>
<td>-15%</td>
</tr>
<tr>
<td>Capital Expenditures</td>
<td>$21,549</td>
<td>$24,413</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

Sources: Date from NTD, National Transit Summaries and Trends, Table Series TS1.1, Time series data. https://www.transit.dot.gov/ntd/data-product/2019-time-series

Pre-COVID public transportation was approximately a $75 billion annual industry with about two-thirds of the funding supporting operations and the remainder supporting capital. Federal investment provided approximately 15% of total annual revenues. COVID-impacted numbers will not be finalized for months, thus rough estimates are shown in Table 1 to characterize relative trends. With the American Rescue Act, the federal share of resources obligated to public transportation in 2020 and 2021 is likely to approach 50%, perhaps more, depending on the actual levels of spending in 2020 and 2021 and the level of local subsidy resources collected and/or committed to transit. The year of commitment is not necessarily the year of expenditure, thus actual financial impacts may vary at the national and at the local level.

**TRIMET’S STRUGGLING COMMUTER RAIL LINE SEES COST-PER-PASSENGER RISE TO NEARLY $108**

TriMet’s Westside Express Service, known as WES, was already headed in the wrong direction with rising costs and declining ridership. The pandemic has made the commuter rail line’s struggles even more pronounced.

Ridership on WES was down nearly 75% in December 2020 compared to the same month in 2019, according to the most recent data available.

At the current rate, it costs TriMet nearly $108 per passenger to operate the metro area’s only commuter rail line.


**RELEVANT FUNDING CONCERNS FOR POLICYMAKERS**

The following observations are relevant to the policy considerations that surround the future of public transportation and the federal financial role.

- The $40 billion incremental level of federal transit funding in CARES and the COVID-19 Emergency Relief Act of 2020 are equivalent to about 32 months of typical transit fare revenues. Even with diminished fare revenues, new federal resources before the American Rescue Plan are sufficient to offset three or more
years of lost fare revenues for the industry. As the distribution of these funds was not based on lost fare revenues, the above conditions do not apply to all agencies.

- As supplemental resources provided to transit agencies do not require a match or a maintenance of effort from other revenue sources, they can and are being used to offset shortages in or diversions of other funding sources.  

- The consequences of these federal resources vary dramatically across agencies. For agencies highly dependent on fare revenues, the CARES allocation may not have fully offset fare revenue losses for the duration of COVID-19. For agencies with relatively low fare box recovery and stable dedicated local revenues, for example property taxes, CARES revenues created a windfall.

- The initiation of supplemental federal support during the critical stage of the COVID-19 crisis was understandably rushed and not fine-tuned to provide a policy-driven distribution of supplemental federal resources. However, having provided very generous federal resources to mitigate the immediate crisis, additional funding should be driven by careful analysis of the financial condition of agencies and discernment of a sound, policy-driven program of support.

- Reauthorization of national surface transportation legislation, scheduled before fiscal 2022, provides an additional opportunity to reconsider industry needs and the federal role. Similarly, the prospect of an infrastructure funding bill also provides an opportunity to address transit industry resource needs. All future legislative actions should be informed by a more comprehensive review of the financial impacts and roles of the public transportation stakeholders.

- Potential negative consequences of the current actions include a diminishment of local and state resource commitments to public transportation and a temptation by agencies to ramp up transit spending irrespective of the travel demand that currently exists or is likely to occur post-COVID-19. The extraordinary level of federal funding also creates the prospect of a financial crisis as the federal funding levels retract to financially sustainable levels.

- The commitment of $40 billion and then an additional $30.5 billion in new resources for public transit without proportional commitments to support COVID-19 financial impacts on roadway investments, when roadways support all commercial and freight roadway travel and serve about 70 times more person-miles of travel.

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than public transportation, raises issues of equity across geography and market segments.

As Table 1 shows, it is very probable that the total resources available to transit agencies in 2021 will exceed levels that would have existed had COVID-19 not occurred. While these resources are not required to be expended in 2021, it raises questions regarding the rush to provide supplemental resources absent a fuller understanding of the financial needs and an explicit consideration of the federal funding role as a backstop for all potential revenue shortages or diversions.

As the COVID-19 pandemic extends beyond one year, analysts are increasingly aware that the post-COVID-19 world will not be a return to the pre-COVID-19 normal. The best means of accomplishing the goals that public transportation has historically addressed merits a high level of attention. The biggest problem associated with supplemental federal funding that exceeds five years of typical federal appropriations to the Federal Transit Administration is the failure to think strategically. Providing public transportation during recovery and in a post-COVID-19 world should be based on assessing the specific role and mechanism of specific systems and right-sizing the subsidies.

For instance, in 2020 and 2021 the federal government is likely to have committed approximately $10 per transit boarding, on average. Since approximately half of trips that use transit require a transfer (for example switching trains at Metro Center in Washington, D.C.), the average one-way transit trip could be receiving $15 in federal subsidy. But resources are precious and priorities abound, and deficit spending has significant future consequences that burden future generations and raise important equity issues. It is imperative to rethink the future of public transportation.

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TRANSIT TRENDS FOR CONSIDERATION

3.1 PRE-COVID TRANSIT USE DECLINE DUE TO AUTO USE

Pre-COVID-19, public transportation had just stabilized after a five-year decline in ridership nationally despite a robust economy, record numbers of workers, and expanding levels of service.

A careful review of the future of public transportation is justified due to more than just the impact of COVID-19. Pre-COVID-19, public transportation had just stabilized after a five-year decline in ridership nationally despite a robust economy, record numbers of workers, and expanding levels of service. The contributing factors were numerous, including expanded auto availability spurred by low gas prices, low used car prices and financing, and expanded licensure opportunities in several states for undocumented immigrants. Increased telecommuting and other communication substitution rose substantially, with
telecommuting passing public transportation as a share of regular commuters, reaching 5.7% in 2019.⁵

Transportation network companies such as Uber and Lyft were capturing some trips from public transportation as were e-scooters and bikeshare. Demographic trends were similarly unfavorable as population growth flourished in less-urban areas with modest public transportation while strong public transportation markets, typically in dense, urban areas such as Chicago, saw population declines. The large millennial generation was aging out of the traditional strong transit use age groups of young adults. Low income, often public transit-dependent populations (persons who because of financial, health, legal or other reasons are not able to avail themselves of personal vehicle travel and often rely on public transit) were being dispersed with new public housing policies and regentrification of urban core communities that often had good transit services. System condition, service reliability, homelessness, and urban crime were deterring riders in some communities.

If these conditions were not challenging enough, the public transportation industry is facing the prospect of future competition from automated vehicle services as alternative travel choices. While the timing of the availability of such services remains speculative, it appears to be well within the timeframes of the major transit capital projects being constructed and planned in communities. The expectation of electrification of personal vehicles in the future will further undermine the already weak environmental motivations for supporting and using public transportation.

Beyond these preexisting challenges for public transit, COVID-19 introduced new challenges and increased the significance of other challenges for public transit ridership. COVID-19 is accelerating demographic trends unfavorable to public transportation. Lower density, more-dispersed housing is seeing unprecedented demand with population movements both to suburbs and to smaller communities or communities with lower density.⁶ Other activity patterns also appear to be shifting as traditional retail and office buildings may be destined for changes in use levels and perhaps purposes. To the extent that central business districts or other information office worker concentrations have fewer


employees due to increased working-at-home, the supporting activity levels such as restaurants, convenience retail, and services may see diminished demand as well.

COVID-19 has also been credited with increasing auto ownership as anecdotal reports indicate that after shutdowns started to end some individuals purchased autos to allow them to avoid exposure while traveling on shared use modes like public transit and air travel. These changes may result in permanent changes in modal travel demand as new behaviors are retained. Understanding the extent of this change will be revealed as new data are assembled over the next many months.

The expectation of continued growth in substitution of communications for travel existed pre-COVID-19. However, the COVID-19 experience dramatically accelerated its adoption. The significance of this phenomenon in many ways dwarfs the impact of other factors.

DECLINING TRANSIT USE DUE TO SHIFT TO WORKING-AT-HOME

While the verdict is out regarding how much communications will continue to substitute for travel as public health exposure risks fade from importance, there is a growing consensus that many of the communication substitutions for travel will continue. This will take the form of meaningfully larger work-at-home levels than existed pre-COVID-19, continued use of e-commerce in lieu of travel for some retail, and continued levels of conducting a myriad of personal business, social, and educational activities via online communications.

Education, health care visits, worship participation, and business transactions such as renewing licenses and executing financial contracts are among the activities that will no longer produce trips to the extent they did pre-COVID-19. This will reduce the demand for public transit and lessen roadway congestion and parking challenges—factors that could weigh into mode choice decisions. The market profile of transit riders is likely to skew downward as higher income information workers are likely to be able to telecommute in even greater numbers than before and not commute by transit. Transit may also decline with post-COVID-19 hybrid commuting behavior, with in-office work one or two days per week with work-at-home the remainder. Tuesdays, Wednesdays, and Thursdays could require relatively strong peak service levels with very soft demand on Mondays and Fridays, conditions that may make it harder to justify peak capacity capital investments and complicate service scheduling or operating productivity.
RISE IN TELECOMMUTING CAUSES BIG HEADACHE FOR MEGACITIES WITH BIG TRANSIT SUBSIDIES

“The most important outcome of the pandemic wasn’t that it taught you how to use Zoom, but rather that it forced everybody else to use Zoom,” Autor told me. “We all leapfrogged over the coordination problem at the exact same time.” Meetings, business lunches, work trips—all these things will still happen in the after world. But nobody will forget the lesson we were all just forced to learn: Telecommunications doesn’t have to be the perfect substitute for in-person meetings, as long as it’s mostly good enough. For the most part, remote work just works.

—Derek Thompson, The Atlantic, February 1, 2021

“Salesforce says ‘the 9-to-5 workday is dead’ and will provide 3 new ways for employees to work—including the possibility of working from home forever...”

—Avery Hartmans, Insider, February 9, 2021

Public transportation is uniquely sensitive to these changes. If work-at-home doubles from a pre-COVID-19 level of 5.7% (this includes those who are employed and work at home as well as those that have home-based businesses) to 12%, it could mean a 15%-20% decline in central business worker numbers. Information jobs particularly conducive to work-at-home tend to be concentrated in central business district locations that are among the primary geographic targets of public transportation services, often serving as the hub of transit systems. These are the jobs most likely to be diverted to work-at-home or to shift to dispersed employment centers outside the urban core.7

TRANSIT DECLINE BY SUBMODES

Among the most significant phenomenon resulting from COVID-19 is the disparate impact on transit use across the transit submodes. National Transit Database data from recent months indicate that the decline in ridership is greatest among the modes most used for workforce commuting, particularly the transit services targeting choice commuters to central business districts. Commuter rail, for example, has high numbers of travelers who have jobs that are conducive to work-at-home and are in a financial position to use alternative modes when they do travel. Ridership declines in that submode are far greater than for urban bus services.

PHILADELPHIA’S SEPTA INTENDS TO SPEND $40M IN FEDERAL COVID-19 RELIEF ON PROPOSED KING OF PRUSSIA RAIL LINE

SEPTA is proposing to spend about $40 million in federal economic relief funds, mostly earmarked to help transit agencies operate buses and trains during the pandemic, on design and engineering work to advance the King of Prussia rail project.

Some Philadelphia transit advocates express worry that the budgetary move will make it harder to maintain levels of service needed to prevent overcrowding on city buses, potentially endangering passengers and operators.


One of the consequences of soft public transit demand is that it undermines attainment of a key purported benefit of public transportation: being an environmentally efficient means of moving people. While public transportation certainly has that potential, as Figures 4 and 5 portray, context matters and historic conditions or theoretical potential are not necessarily indicative of actual future performance. Figure 4 shows the change in occupancies of the various submodes as a result of the ridership and service changes attributed to COVID-19.

While the industry does not, and should not, expect these same conditions to apply as the COVID-19 virus subsides, the accumulated evidence suggests that the already disappointing pre-COVID-19 transit vehicle average occupancy levels are not likely to be attained going forward, particularly if service levels are not adjusted to demand.

Figure 5 reveals the energy use per passenger-mile of travel in “gasoline gallons equivalent” for various modes of travel. The greater the number of passenger-miles per gallon equals a more energy-efficient mode. The blue bars indicate the most recent available data from the Department of Energy reflective of pre-COVID-19 real-world operating conditions. Public transportation modes were not performing particularly well with respect to passenger-miles per gasoline gallon equivalent even prior to COVID-19. The red bars represent the comparative performance in late 2020 given the lower vehicle occupancies due to the influence of COVID-19. Even with the referenced reduced service levels, the low occupancies result in very energy-inefficient service.
FIGURE 5: AVERAGE PER-PASSENGER FUEL ECONOMY BY TRAVEL MODE

Source: U.S. Department of Energy Alternative Fuels Data Center supplemented with estimated occupancies during the first full year of COVID

Not surprisingly, public transportation is a resource-inefficient means of moving people when subject to the ridership demand levels and social distancing phenomenon associated with COVID-19. If service levels are not adjusted to post-COVID-19 demand, energy efficiency performance is likely to be well below the pre-COVID-19 levels. The energy efficiency arguments for public transportation will no longer be valid absent an unanticipated surge in demand and productivity for public transportation. The competitive pressures on public transportation’s environmental performance will be further increased as personal vehicles move toward greater efficiency and electrification. This challenge should provide additional evidence of the need to seriously rethink the full spectrum of objectives and mechanisms for delivering public transportation services and meeting mobility needs.
Many public transportation stakeholders have recognized the critical challenges that face public transportation in a post-COVID-19 era. Agencies are planning various scenarios, stakeholders are exploring strategies for the future, and analysts are watching the data to discern emerging trends. But not all stakeholders have grasped the significance of the challenges facing public transportation and many have focused attention on asking for federal resources to “carry them through” the impacts of COVID-19, while others are busy redefining the performance metrics and expectations of public transportation to justify unconditional federal funding. References to the tiny share requested for public transportation of huge stimulus bills are frequently part of the rationalization of unconstrained funding requests. The hypersensitive political environment is being leveraged with emotionally charged terms like equity, accessibility, and essential workers to champion advocacy for unprecedented levels of federal funding and an unplanned, ad hoc, unaccountable shift in the financial decision-making for public transportation.

**POST-COVID, TRANSIT AGENCIES MUST LOOK BEYOND RIDERSHIP**

With commuters grounded and passenger numbers likely to remain low in U.S. cities, public transportation leaders should focus on a different metric for usefulness: transit access.

—David Zipper, Bloomberg CityLab, February 16, 2021
CONCLUSION

Transportation has been dramatically changing even before COVID-19 appeared on the scene. The COVID pandemic has accelerated the pace of change and when, hopefully, the pandemic fades as a critical factor in travel behavior, then demographic, economic, and particularly technological changes are likely to leave us in a far more dynamic travel behavior environment than has persisted for the past three-quarters of a century. We have historically been content to use 30-year planning horizons for transit capital investment planning that were driven by often 10-year-old travel behavior models and data and relatively stable presumptions with respect to travel choices, capital and operating cost trends, propulsion system efficiency, and the spectrum of travel choices with which transit competes. Continued reliance on dated planning methods and pre COVID-19 data is fraught with risks as we plan the future.

The absence of easy solutions to the challenges facing public transportation—or the fact that these solutions may not be satisfying to all stakeholders—is not an excuse for policymakers to ignore the magnitude of the challenges facing public transportation. The core goals of public transportation—providing mobility particularly for those without alternative means and capturing the economy of mass movement of people in markets where those conditions exist—remain important and widely held goals for transportation. Planners and policymakers must explore the full range of methods of accomplishing these objectives without preconceived commitments to status quo plans and strategies. Underused transit vehicles do not fight climate change and exorbitantly expensive transit trips
are not a prudent way to spend public resources when the magnitude of needs for transportation, housing, health care, education, and infrastructure are so large.

Good intentions are not necessarily good policy. If there were ever a time to be careful, deliberative, and fact-driven regarding the future of public transportation, now is that time.
ABOUT THE AUTHOR

Steven E. Polzin, PhD, worked for transit agencies in Northern Illinois, Cleveland, and Dallas. He subsequently researched and taught transportation at the University of South Florida, including extensive research on public transportation and travel behavior. He served for 13 years as a member of the Board of Directors for the Hillsborough Area Regional Transit Authority and seven years as a Board Member for the Hillsborough Metropolitan Planning Organization. He recently completed an appointment as a Senior Advisor for Research and Technology at USDOT.