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As Municipal Bond Rates Fall to Historic Lows and Issuers Deleverage Bonds, the Age-Old Infrastructure Problem Worsens

July 27, 2021

Complaints about infrastructure are reminiscent of Mark Twain's famous quote about the weather, *"Everyone talks about it, but nobody does anything about it."*

The problem of underfunded infrastructure has been a familiar concern to those in public finance since the late-1970s. Among the earliest pioneer studies that warned about widespread infrastructure gaps was developed by The Urban Institute, which documented the problem in several case studies. In 1983, American economist Pat Choate, elaborated on the morass in his book, *"America in Ruins: The Decaying Infrastructure."*

Despite periodic steps forward to address the issue over the years, the rebuilding effort is still a long way from meeting the expectations of civil engineers, accountants, and the public at large. Updating and maintaining infrastructure remains as much of a challenge today as it was 40 years ago.

The good news is that the issue is again at the forefront of public consciousness and is close to a decision that could move it forward. Federal funding for infrastructure investment has widespread support from the President and Congress in general. However, bi-partisan differences remain as our leaders debate the proposed scale of the bill and its specific elements. While observers exhibit cautious optimism that a bill will pass in some form, there are no guarantees.

Missed Opportunities

Ironically, over the past ten years, low interest rates in the tax-exempt municipal bond market provided a significant opportunity to tackle the infrastructure gap through traditional borrowing. Instead, most governments in need of infrastructure repair failed to take sufficient advantage of low rates to restore and modernize their capital assets.

While political reluctance to take on massive public works projects is understandable, doing too little only makes the challenge more expensive when the inevitable restoration enters critical stage.

Riding a wave of decreasing borrowing rates, tax-exempt issuers enjoyed one of the longest stretches of low-cost borrowing in history. In seven of the last eleven years, the benchmark Refinitiv MMD AAA 30-year tax-exempt municipal bond averaged a daily yield of less than 3%. On July 23, 2021, the benchmark stood at 1.36 %, well below the 2010 average daily yield of 4.25%. These levels contrast favorably to annual long-term tax-exempt rates averaging more than 4% since 1968.

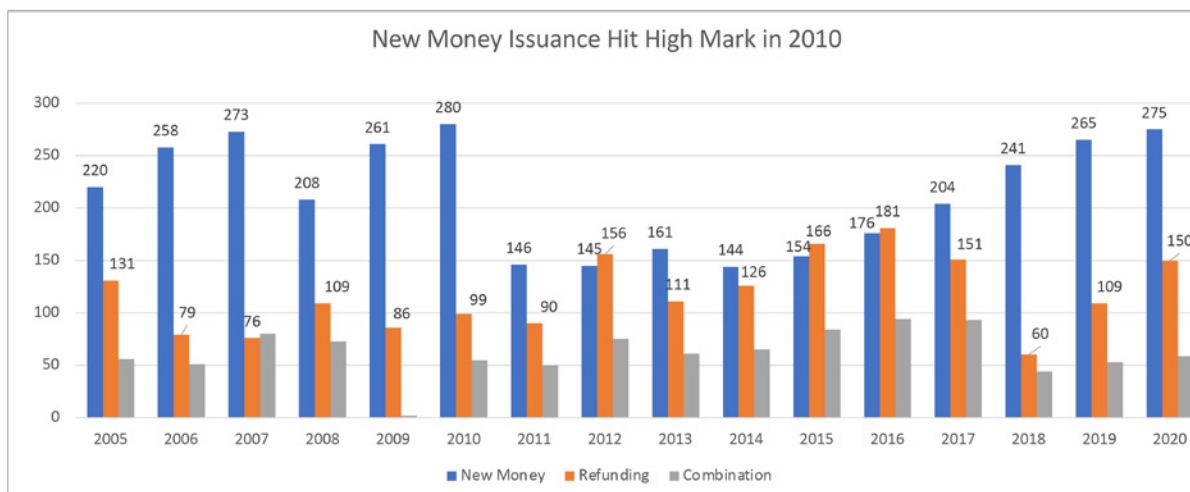
Although recent low rates have propelled the issue of municipal bonds to record levels, a substantial proportion of the bond proceeds were used to pay down debt, rather than commence a frontal assault on America's aging capital stock. This trend has been especially evident since 2010 when, in the aftermath of the Great Recession, approximately 40% of bond proceeds were used to refund or refinance outstanding debt.

Figure 1 shows how new money issuance reached a peak of \$280 billion in 2010, due in large part to Build America (taxable) Bond programs that paid for "shovel ready" infrastructure projects subsidized by the federal government. This figure was almost eclipsed in 2020, although a significant share of those bonds was instead intended to cover anticipated deficits related to the COVID-19 crisis.

This fact illustrates another caveat: the idea that new money issuance is equated only to capital improvements is not always accurate. They are sometimes used as working capital to cover deficits, reserves, pension liabilities, and other non-fixed assets.

FIGURE 1

New Issue Bond Volume (\$ Millions) New Money vs Refunding Issuance Trend: 2005-2020



Source: The Bond Buyer. New Money issuance refers to bond proceeds used for purposes other than refunding; new money can provide cash for capital improvements or working cash for purposes other than brick and mortar projects. Combination refers to bond issues that contain both new money and refunding proceeds.

Low rates created a window of opportunity to bring infrastructure rebuild projects to the forefront of public policy, but those aspirations fell short. Shocked by the 2008 credit crisis, the public finance sector generally took a more guarded stance on debt issuance. That was especially true in mature, slower growing, less affluent local economies bogged down by mounting unfunded pension liabilities.

Financing Tomorrow's Infrastructure: The Window of Opportunity Remains

Despite policy differences on the size and scope of federal support, hope remains that a Congressional bill to subsidize infrastructure rebuilding will be approved. Regardless of what happens in Washington, historically low long-term borrowing rates remain available for public entities to take a more aggressive approach in addressing their infrastructure needs.

Municipal bond sectors across the board have seen the cost of outstanding debt loads decline, as entities refinance their existing debt. This, in turn, creates some budgetary breathing room for infrastructure improvements without increasing the burden on taxpayers, ratepayers, and other stakeholders.

Low rates, stabilized credit quality, and a strong appetite for bonds across much of the municipal spectrum have narrowed the yield difference between higher and lower quality borrowers. This means that lower rated bonds and credit sectors are also able to reap the benefits of borrowing at a lower cost than would be the case in more traditional interest rate environments.

New Ratio Accounts for Aggregate Outstanding Borrowing Rate

Merritt Research Services has developed a method to quantify the net effect of lower outstanding debt costs on borrowers in all major credit sectors. The impact is real, and the corresponding savings reinforce the idea that now is the time to proceed with increasingly essential capital plan improvements.

This new quantitative measure assesses a municipal bond credit's relative interest cost burden by sector type and views it within the context of its own five-to-ten-year trend.

Using audited financial data on approximately 10,000 municipal bond borrowers (credits), and by applying an accrual basis accounting approach consistent with Generally Accepted Accounting Principles (GAAP), each credit's aggregate outstanding borrowing rate (ABR) was calculated by comparing the interest expense to total debt outstanding. For governments, that means that only those with financial statements in compliance with Governmental Accounting Standards Board (GASB) Statement 34 Governmental Activities were eligible. Parallel accounting input items from the GASB Business Activities Statement and Financial Accounting Standards Board (FASB) are used to create the same ratio. About 90% of the potential 10,000 municipal borrowers in the Merritt Research database had audits consistent with GAAP standards enabling the calculation of the ABR.

The ABR reflects the carrying cost to hold municipal bond indebtedness on a percentage basis. Based on data collected for the most recent audit year available, we found evidence of all major municipal bond sectors running at historic lows.

This analysis must take into consideration technical factors, particularly related to bond structure and the use of taxable bonds, that may affect comparisons between credits – sometimes even within the same borrower portfolio. Nevertheless, this examination of the ABR remains useful when evaluating the carrying cost burden.

Fiscal Year 2020 audits are still being collected, which means that final sector median numbers for the year will likely adjust from their current levels. In the interim, the 2019 median rate offers a more complete ultimate data set, especially for those belonging to governments and their related enterprises. This is due, mainly, to their historical track record of furnishing late reports, and the high percentage of entities that finish their fiscal year on a calendar basis (December 31).

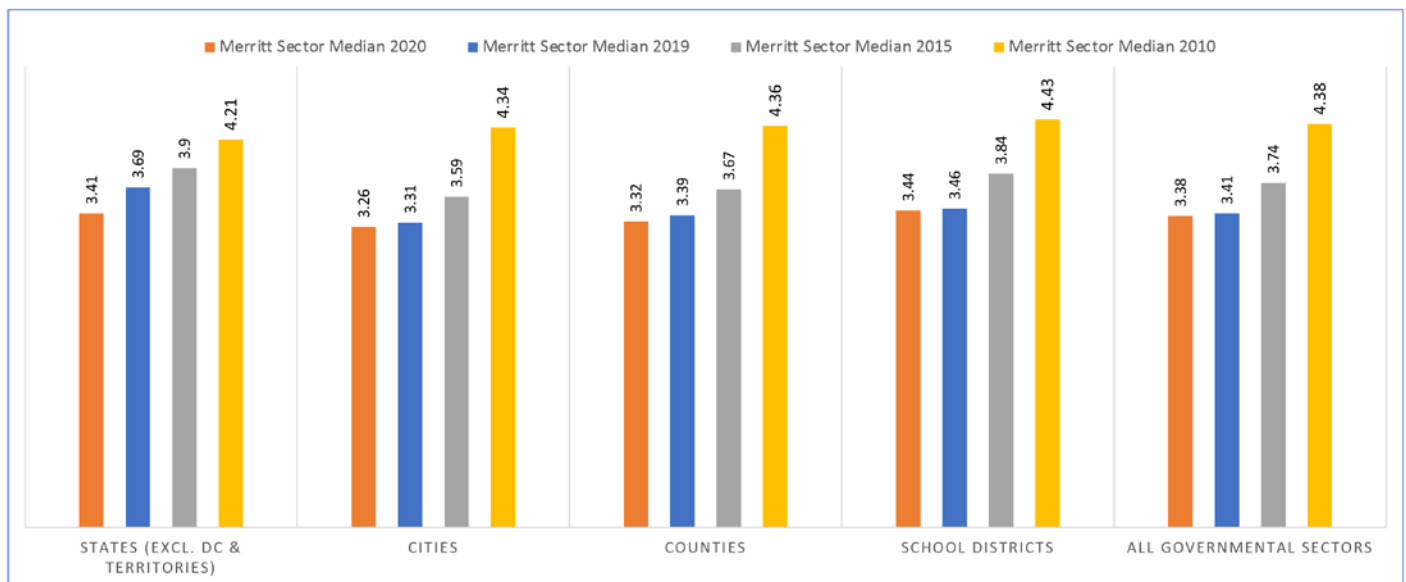
This ABR analysis separates borrowing types into two major groupings: (1) those that can issue general obligation bonds and use Governmental Activities presentation of GASB 34 accounting standards, and (2) entities that are structured typically as business type entities. Certain types of bonds, including dedicated Tax and Community College notes, are categorized here as revenue bonds even though they are supported in whole or in part by tax revenue.

Effect on General Obligation Sectors

Since 2010, the median aggregate outstanding borrowing cost of the general obligation group – which includes states, cities, counties, and school districts – fell by 1%. All things being equal, this means borrowers save about \$1 million in a single year on outstanding debt amounts of \$100 million. Those savings can be leveraged and applied to a new 30-year bond issue to address a wider base of necessary infrastructure improvements. Although many local government audits are still being reported, cities appear poised to benefit from the lowest sector aggregate borrowing rate among all General Obligation and Revenue bond sectors for FY 2019 and 2020 (group median rates of 3.26% and 3.31%, respectively). Counties have a slightly higher ABR for fiscal years 2019 and 2020, as do states and school districts with higher median aggregate borrowing rates.

FIGURE 2

Annual Median Aggregate Outstanding Borrowing Rates % by Governmental Municipal Credit Sectors Fiscal Years 2020*, 2019, 2015 and 2010



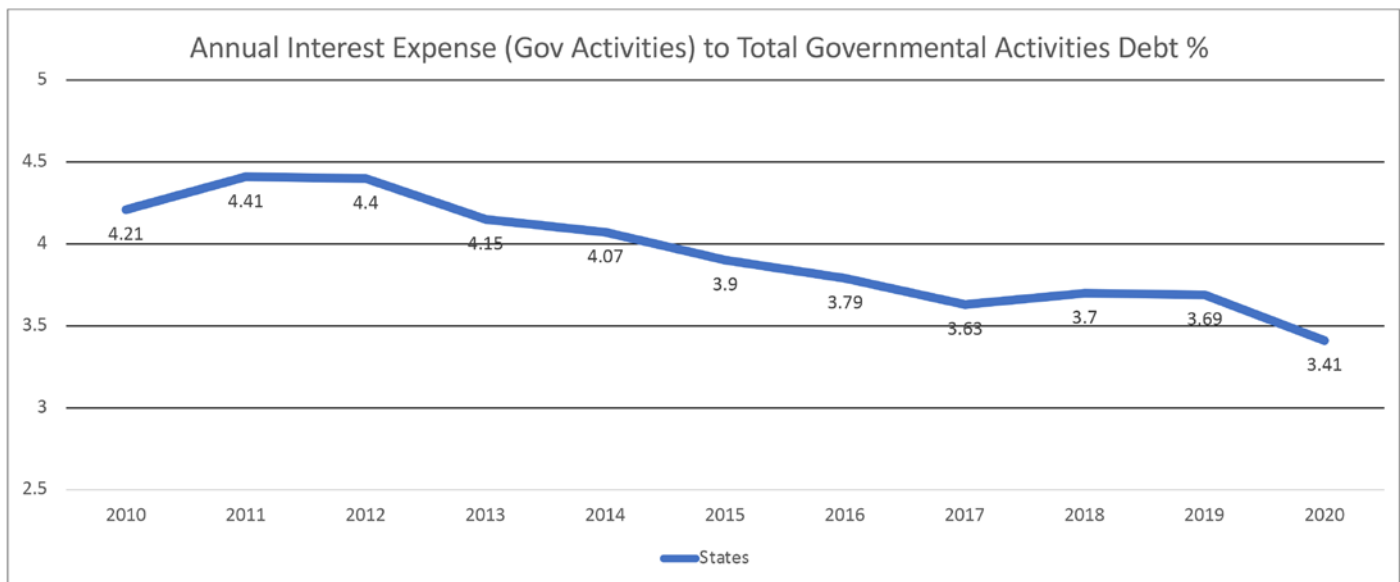
Source: Merritt Research Services, an Investortools Company. *Derived from Data Received from Audits as of July 9, 2021. The collection of audits, particularly for FY 2020 is ongoing.

Though cities carry the lowest ABR as a group, certain types of cities generally have higher borrowing rates. Large cities with populations exceeding 500,000, for example, have a Fiscal Year 2019 median aggregate borrowing rate that is three-tenths of 1% higher than the approximate total of 1,500 cities of all sizes tracked by Merritt Research.

Figure 3 demonstrates the downward trend for states in their aggregate interest cost over the past decade. The exception is the two-year span between 2010 and 2012, in the aftermath of the Great Recession, when credit concerns and taxable Build America Bonds with higher yields were contributing factors. Otherwise, state borrowing rates have paralleled the Treasury’s downward trends, as state governments were able to mostly brush off COVID credit concerns due to assistance from the federal government’s American Rescue Plan and the Federal Reserve Bank’s Municipal Liquidity programs.

FIGURE 3

Aggregate Outstanding Borrowing Rate (%) Trend* State Government Medians: 2010 to 2020



Source: Merritt Research Services, an Investortools Company. *Excludes Territories and D.C. States not yet reporting 2020 audits are Illinois, Arizona, California and Iowa.

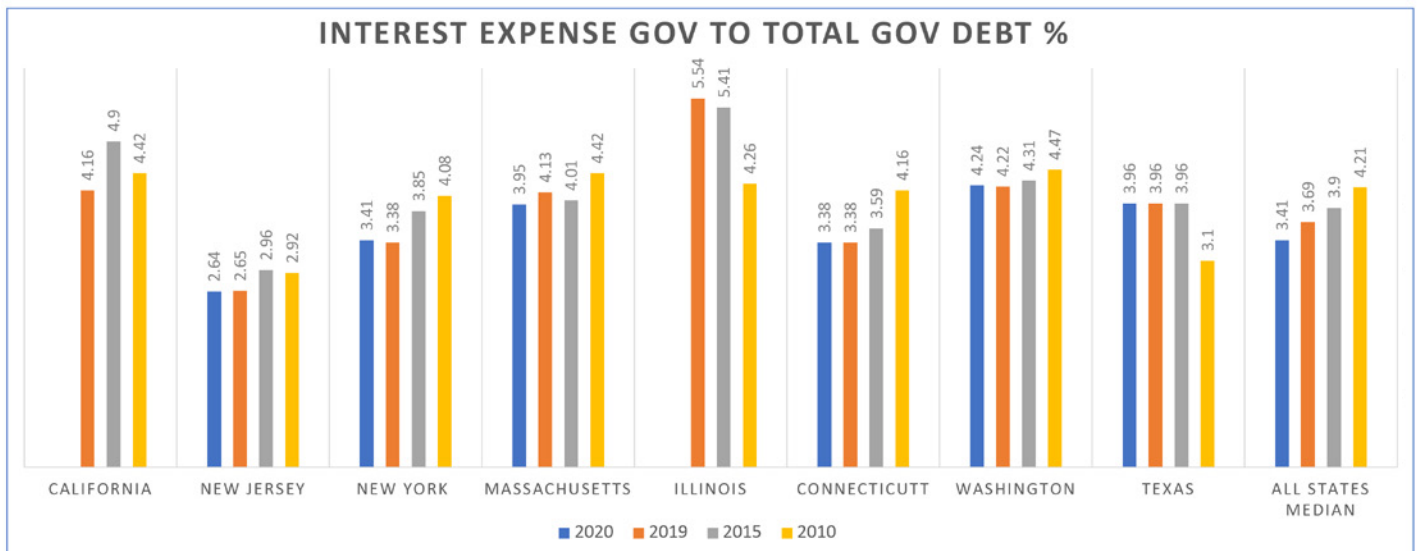
Aggregate Borrowing Rates by State Governments with Largest Debt Loads

The eight states with the largest amount of outstanding total governmental activities debt at the close of their fiscal year are shown in Figure 4. Illinois, which has not released its 2020 audit, had the highest aggregate outstanding borrowing rate of the group in 2019 (5.54%). With the lowest credit rating in the nation, it is not surprising that Illinois sits at the top of the group. Illinois’ substantial use of taxable bond financings, the higher interest costs it pays on its backlog of bills, and its lack of state tax-exemptions, all contributed to a higher interest expense ratio.

New Jersey, which has the second lowest state credit rating, appears to carry the lowest ABR. However, New Jersey’s aggregate borrowing rate appears low primarily because of its accounting approach and bond structure. The state is a frequent user of high premium 5% coupon bond issues, and its debt mix includes Capital Appreciation Bonds (CAB). Under GAAP based accrual accounting, high premium bonds reduce the interest expense by adjusting for the cash component received above par when the bonds were first issued (amortization of the premium). Stated more simply, Capital Appreciation Bonds reduce debt service in the short term. Another factor that lowers New Jersey’s interest rates relative to Illinois is that its bonds are state tax-exempt, which lowers borrowing costs. It should be noted, however, that the median interest expense for all states has been trending downward.

FIGURE 4

State Aggregate Outstanding Borrowing Rates (%)
 (States with Total Governmental Activities Debt Amounts of over \$20 Billion)
Fiscal Years: 2020, 2019, 2015 and 2010



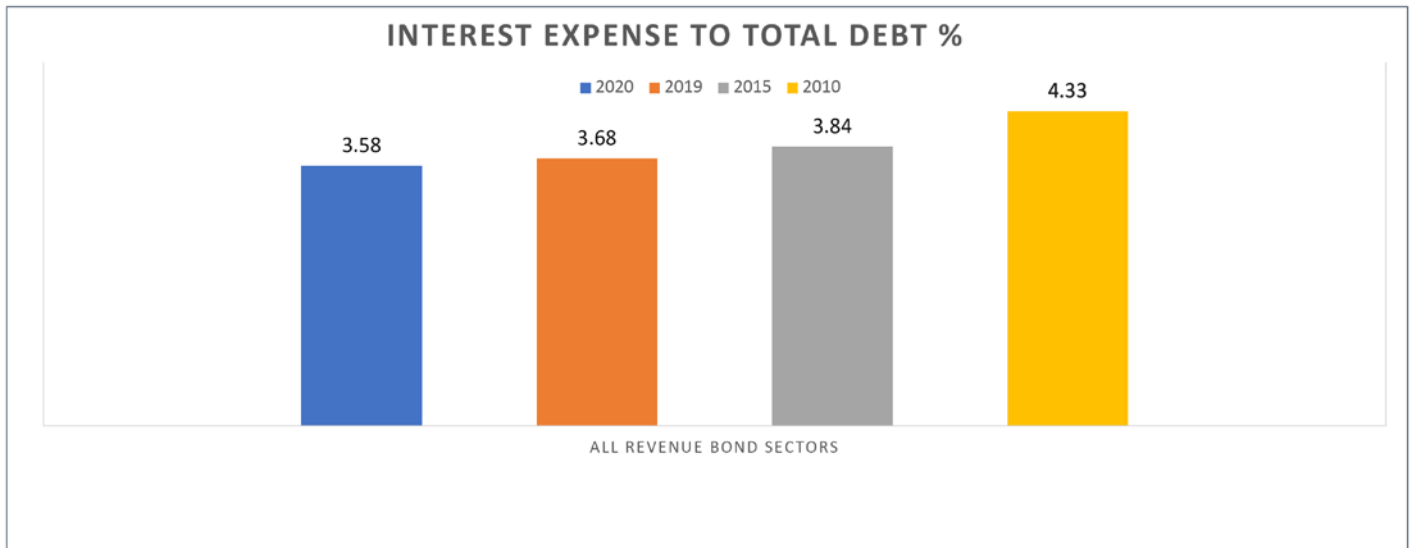
Source: Merritt Research Services, an Investortools Company. Data as of July 9, 2021. California and Illinois are among four states that have not yet reported FY 2020 audits as of the date of this analysis.

Impact on Revenue Bond Sectors

As a group, municipal Revenue Bonds issued by public enterprises, special purpose entities, and other authorities – including hospitals, private universities, and not-for-profit tax-exempt entities – have seen interest costs on borrowed money decline over the past decade (Figure 5).

FIGURE 5

**Annual Median Aggregate Outstanding Borrowing Rate %
 All Municipal Revenue Bond Sectors**
 for Fiscal Years 2020*, 2019, 2015 and 2010



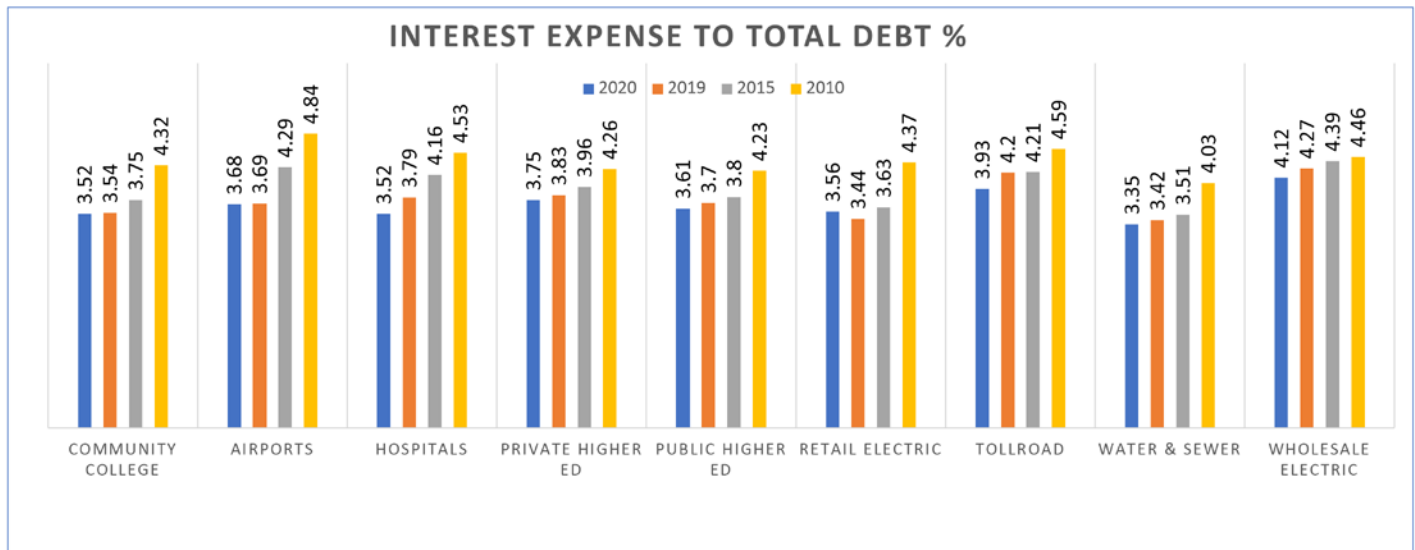
Source: Merritt Research Services, an Investortools Company. *Derived from Data Received from Audits as of July 9, 2021. The collection of audits, particularly for FY 2020, is ongoing.

Although the median interest rate reduction for revenue bonds occurred between 2010 to 2020, the divergence was greater among revenue sectors than for general obligation sectors.

Airports and hospitals experienced the greatest benefit, with their sectors' interest expense ratios dropping 1.2 % and 1%, respectively. Meanwhile, the wholesale electric borrowing rate median fell by only one-third of 1. (See Figure 6)

FIGURE 6

Annual Median Aggregate Outstanding Borrowing Rates % by Municipal Revenue Bond Credit Sector and Trend for Fiscal Years 2020*, 2019, 2015 and 2010



Source: Merritt Research Services, an Investortools Company. *Derived from Data Received from Audits as of July 9, 2021. The collection of audits, particularly for FY 2020 is ongoing.

Since revenue bond entities are generally timelier in reporting their audits than those in the general obligation sector, their fiscal year 2020 audit medians likely offer an enhanced level of accuracy. Meanwhile, many sectors that were most threatened by the COVID virus show interesting outcomes, mainly because they include a high percentage of fiscal year 2020 audits.

Hospital and hospital systems having fiscal year 2020 audits comprise 76% of the 865 credits counted relative to fiscal year 2019. Other noteworthy FY 2020 vs. FY 2019 figures include:

- Toll roads: 91% of 77 credits.
- Airports: 88% of 145 credits.
- Higher Education (public): 85% of 318 credits.
- Higher Education (private): 75% of 623 credits.

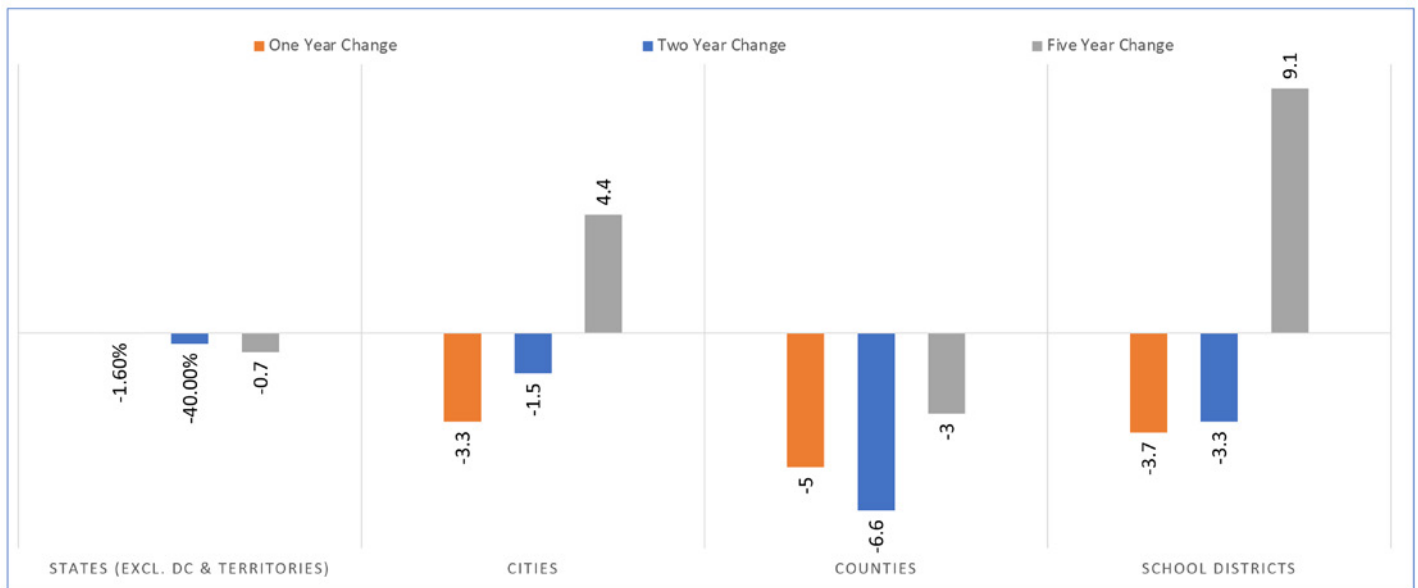
In each of these sectors, borrowing rates were lower in 2020 than the prior year, suggesting one or several of the following possibilities: (1) the market dismissed any widespread negative near- or long term credit implications arising due to the virus; (2) bond issuance was avoided during the most uncertain months of the pandemic; (3) debt maturities and redemptions reduced the overall debt load during the year, or (4) bond issuance that occurred during the fiscal year was used primarily to refinance outstanding debt at lower rates.

Municipal Borrowers Deleverage Debt Loads

Aggregate outstanding borrowing rates have decreased, but Municipal borrowers are also deleveraging their debt loads by letting matured bonds roll off their balance sheets. Using the more complete dataset of FY 2019 audits as the baseline to track governmental bodies and revenue bond issuers, the numbers indicate that total sector debt loads have diminished in actual dollars over the past three years. As Figure 7 illustrates, states held their outstanding debt at slightly lower levels, compared to one, two, or five year ago. Counties, which tend to be more fiscally conservative in character and culture, experienced a significant reduction in bond-financed debt since 2017 and a negative percentage change since 2014. Cities and school districts have also achieved declines in debt outstanding, although levels remain higher than five years ago.

FIGURE 7

Percent Change in Total Debt (Governmental Activities) Outstanding by Governmental Municipal Credit Sectors % Change (One, Two- and Five-Year Lookback from 2019)



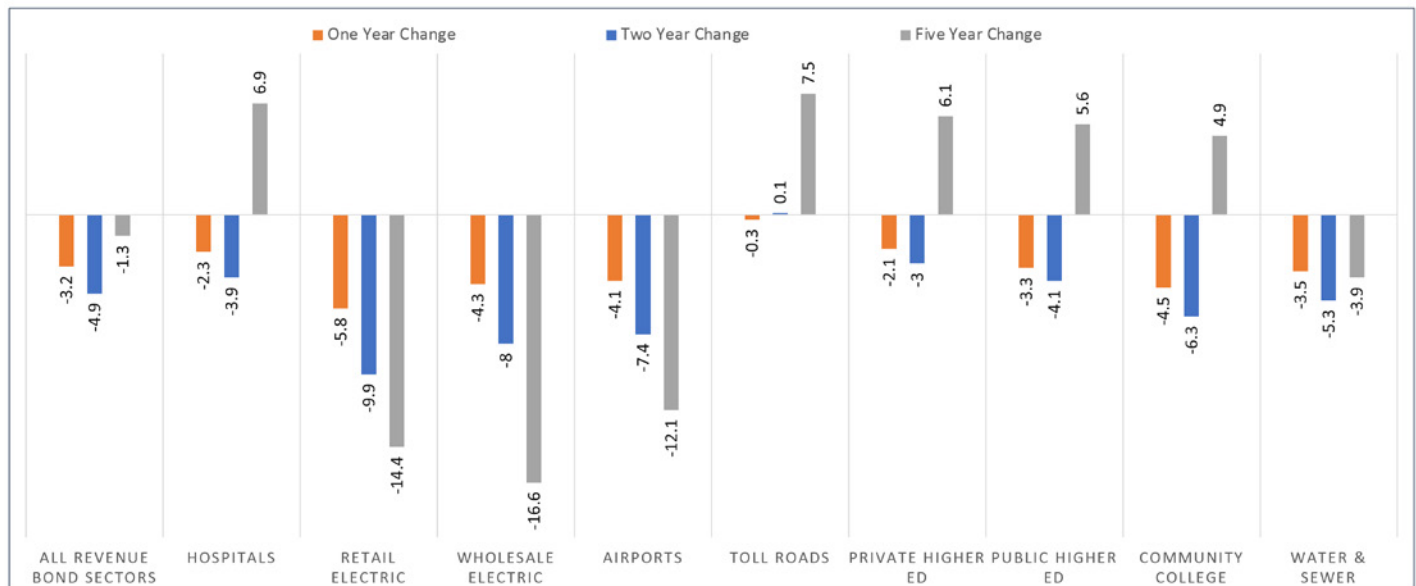
Source: Merritt Research Services, an Investortools Company. *Derived from Data Received from Audits as of July 9, 2021.

This deleveraging of the balance sheet implies that many governments are not adding to their existing debt to fund infrastructure. Indeed, it is possible that capital outlays from current funds are acting as substitutes for debt. However, aging ratios (see next section) do not provide evidence of this taking place in a meaningful way. Among governments, the most likely argument justifying their hesitancy to take on new infrastructure debt is escalating pension and OPEB contributions required to cover actuarial requirements. It is a conscious decision to address underfunded pension liabilities, rather than underfunded infrastructure.

A similar situation is outlined in the chart below highlighting primary municipal bond revenue sectors (and including private colleges and hospitals). All revenue bond sectors except hospitals, toll roads, and higher education have shown a decline in total debt outstanding since 2017. These findings suggest that debt is generally maturing at a rate faster than it is being issued.

FIGURE 8

Percent Change (%) in Total Debt Outstanding by Revenue Bond Credit Sectors (One, Two- and Five-Year % Change Lookback from 2019) Credit Sectors Deleverage



Source: Merritt Research Services, an Investortools Company. *Derived from Data Received from Audits as of July 9, 2021.

Capital Plant Ratio: Tracking the Aging of America's Infrastructure

From an accounting standpoint, the average age of property & plant equipment (PPE) is a commonly used ratio in business and municipal enterprises to monitor the aging of an entity's capital plant. For public entities, the bulk of that number relates to its infrastructure.

This statistic, which is also called the infrastructure or capital plant ratio by financial analysts, is best viewed primarily in the context of tracking the directional trend of a single organization or peer group, rather than comparing different organizational bodies. After all, the capital plant components of one entity's infrastructure may differ significantly from another, and each unit might have substantially different useful life projections. For example, one city may have responsibility for maintaining a broad base of streets, roads, utility lines, and bridges with 50-year useful lives, while another may have no bridges and an infrastructure consisting primarily of shorter lasting asphalt roads estimated to last 15 years.

Regardless of the limitations built into comparing the true and depreciated value of infrastructure, this approach offers a simple and useful method to evaluate management's progress on making improvements that lower the average age of capital stock. The ratio can also be helpful as an absolute number to compare credits within a similar peer group or sector, particularly when there are similarities in the types of infrastructure being assessed. Analysts must be mindful that locational topography, climate, upkeep schedules, and even appraiser methodology can distort comparisons from one credit to another.

Valuing Governmental Infrastructure in Historical Context

It was not until the GASB adopted its Statement 34 guidelines around the turn of the 21st Century that governments were given the estimated appraisal evaluations of their capital plant. Prior to the implementation of GASB 34 rules, it was rare for governments to include anything more than equipment purchases – such as a fleet of cars or fire trucks – on their balance sheets.

Once the rule went into effect, there were still valuation deficiencies. The earliest infrastructures appraisals were less accurate than they are today: governments were not required to include assets built before 1980. In addition, the original cost figures, and major repair records necessary to establish appraisals, were not always available. Though accountants were required to review the estimated useful life projections provided by the entity being audited, these estimates were based on subjective opinions of expected life and maintenance.

Expected life estimates are fundamental to formulating a depreciation schedule, which is integral to creating sound infrastructure statistical measures. Promoting higher standards to calculate more uniform estimated useful life schedules would go a long way towards improving infrastructure comparisons among different credit obligors.

'Average Age of Infrastructure' Metric Points to a Steady Upward Aging Path

Calculating the capital plant ratio, which largely incorporates infrastructure, provides a useful signal that indicates whether fixed assets are depreciating at a faster pace than new funds are helping restore or upgrade the value of the asset. Simply said, if the number moves higher over time, infrastructure is getting older and structural repairs or replacements are not keeping up with necessary repairs.

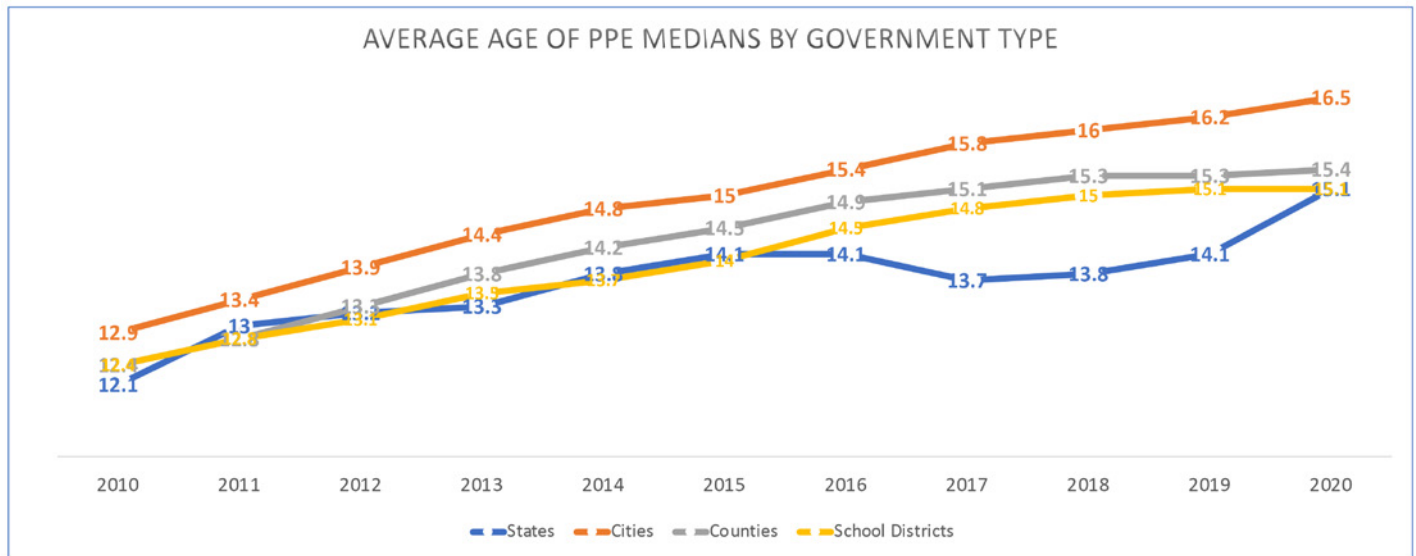
Infrastructure Aging in the Governmental Sectors

In Figure 9, Merritt Research data details a rise in the average age of PPE for three of the four primary state and local governmental sectors. This suggests that repair and renewal efforts are not adequate to maintain the effectiveness of these public assets. Only the state sector reflects a decrease in the age of fixed assets that began in 2017.

Although average age appears to be creeping back up in the most recent data, the fiscal year 2020 preliminary median is not likely to hold when the four remaining states report their audits. All four (California, Illinois, Iowa, and Arizona) had median average age levels of 14.1 or lower in 2019. This offers evidence that the final state median likely will remain closer to 14 than the current 15.1 figure.

FIGURE 9

Aging Governmental Infrastructure Trend: Average Age of Property, Plant & Equipment Medians Trendline 2010-2020* by State and Local Governmental Sectors



Source: Merritt Research Services, an Investortools Company. Medians derived from data received from audits as of July 9, 2021. *The collection and inclusion of audits, particularly for FY2020 is in ongoing.

Taken together, the data suggests that cities are in most need of attention. The median average age of the capital plant ratio for cities has risen steadily from 12.9 years in 2010 to 16.2 years in 2019, and the ratio is pointing higher for 2020. The city median currently stands at 16.5 years, based on 732 of the 1518 cities tracked by Merritt Research Services for FY 2019.

The average PPE ratios for counties and school districts have been trending upward over the past 10 years, but the rate of aging has slowed over the past three.

An important caveat to consider when analyzing the median age of infrastructure, especially for states, involves a GASB 34 rule option that allows governments to avoid fixed asset valuations on their balance sheets. For example, if an independent consultant evaluates the physical condition of all or a portion of a government’s infrastructure, such as a highway, then these assets are not included as part of the entity’s net fixed assets. This option is available for all audits subject to GASB rules, but it is used most often by states (although only a minority of them do so). This can create headaches for analysts trying to assess comparative average age ratios because the modified approach diminishes comparative analysis even further. Therefore, it should not be used in lieu of capital asset valuations.

A word of caution: capital plant ratio cannot be calculated for local governments that do not use GASB 34 Generally Accepted Accounting Standards. New Jersey cities comprise the largest group of governments that instead use state statutory accounting standards, which means that they lack essential infrastructure data. Therefore, they are not included in the infrastructure aging statistics.

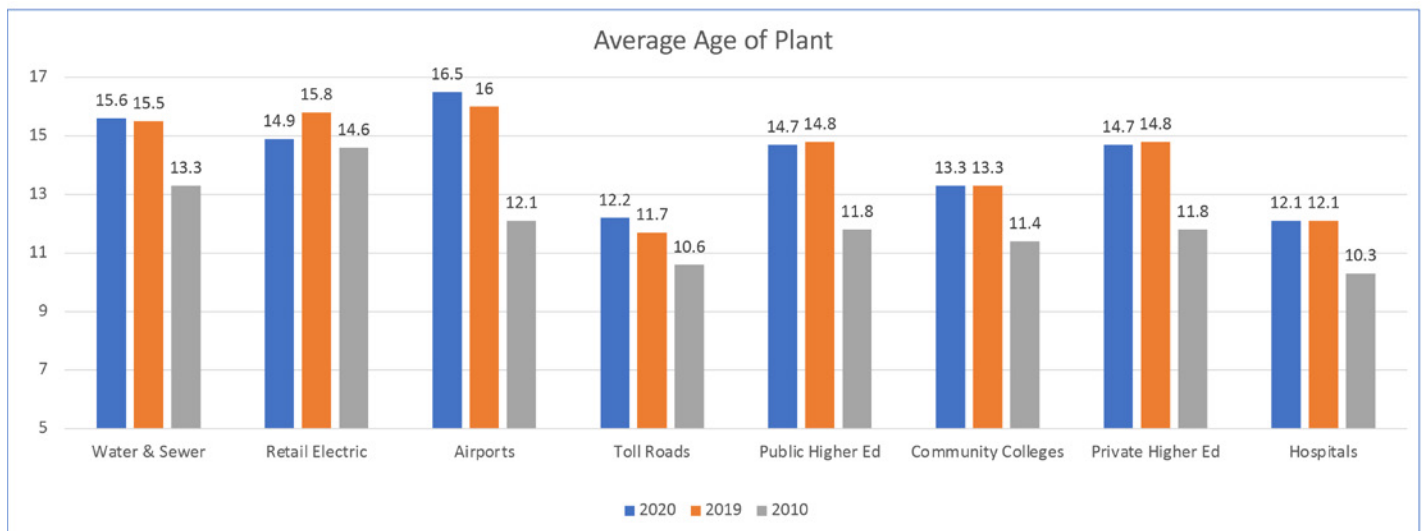
Special Purpose Enterprises and Other Municipal Revenue Bond Sectors

The latest data on municipal market’s revenue bond issuers also shows a negative trend. The median age of plant shown in Figure 10 indicates a significant increase for all sectors over the past decade. The Airport, Public Higher Education, and Private Higher Education sectors recorded average age increases of more than three years each between 2010 to 2020. Retail electric appears to improve in Fiscal Year 2020, but we hesitate to make that call until more audits are completed and counted.

There are noteworthy individual revenue bond obligor exceptions that maintained aggressive building programs within each sector and group, but the medians indicate that most entities had capital facilities that depreciated at faster rates than their respective reinvestment.

FIGURE 10

Aging Infrastructure – Municipal Revenue Bond Sectors Trend: Average Age of Plant Medians Years: 2020*, 2019 & 2010



Source: Merritt Research Services, an Investortools Company. Medians derived from data received from audits as of July 9, 2021. *The collection and inclusion of audits, particularly for FY2020 is in ongoing.

Tracking the average age of physical plant trends by sector peer groups and for individual credits remains a useful analytical tool. Despite certain weaknesses, the ratio is proving its worth as both a credit and good governance metric. The statistics clearly agree with commonly held perceptions that America’s long term infrastructure investment trends must be reversed.

Act: Hold Municipal Borrowers Accountable

Capital repairs can be costly – both financially and politically. Leaders too often favor more immediate budgetary and operational priorities, such as keeping taxes low. In many situations, they have applied debt service savings to pensions, salary increases or politically popular operating programs.

Prudent and equitable debt practices must always remain a priority. Yet avoiding reinvestment in critical transportation and public works projects is highly detrimental to an economy's future. When leaders delay investments in infrastructure, the problems only grow and become more expensive.

Fortunately, analysts and watchdog groups can apply capital plant, PPE and infrastructure-oriented ratios and other metrics to track the trends of individual credits. Knowing the elements involved in calculating these ratios and understanding how to read the data will enhance appropriate interpretations and bond market credit evaluations, and steer public debate for the better.

The time is now. The window for borrowing at historically low interest rates may be closing. As rates rise, higher long-term costs will inhibit project size and escalate multi-generational price tags.

However, the road to addressing these problems will take a significant step forward if Congress passes the \$1 trillion plus infrastructure deal. To the extent that these programs involve local financing, low interest rates should make things easier.

Either way, continuing to defer infrastructure improvements is not a viable option.

Takeaways

- Despite widespread recognition that deferred infrastructure maintenance is a chronic public finance problem, most governmental entities continue to delay comprehensive action.
- Municipal borrowing rates have fallen to historical lows, but refundings represent a higher proportion of new bond issues over the past decade.
- Aggregate outstanding borrowing rates have fallen in all credit sectors and at all quality levels, creating an ideal time to issue new debt.
- The median municipal government outstanding cost of borrowed money has decreased significantly, resulting in potential cost savings that may be applied to a wider base of infrastructure repairs.
- Metrics are useful for holding governments, agencies, and qualified non-profit 501c-3 organizations accountable for maintaining progress on infrastructure aging.
- GASB Accounting rules offer depreciation and appraisal numbers that provide a simple measure for monitoring infrastructure aging.
- All municipal bond sectors have been deleveraging their debt loads since 2017, with retired debt exceeding new bond issues.
- Municipal bond borrowers have not taken full advantage of opportunities to borrow at low rates to fund infrastructure, but the window of opportunity remains open – with or without federal assistance. Issuers must act now before higher rates and inflation return.

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July 27, 2021

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