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**User Charges to Fund State and Local  
Infrastructure Services**

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**I. Introduction: Purpose and Scope**

Twenty years ago, current user charges accounted for 17.7 % of United States state and local general revenues from own-sources. That put it well behind the revenue importance of both the sales and gross receipts (24.8%) and property tax (22.5%) categories and (nearly) the same as the sum of the individual and corporate income tax (17.8%).

Today, current charges account for 21.1 % of state/local own source general revenues—eclipsing the income taxes (18.6%), nearly on par with the property tax (21.2%) and a closing in on the sales and gross receipts category (23.6%).<sup>2</sup>

Looking ahead there are four reasons why this trend is likely to continue. The first is the generally recognized need to improve the nation's physical infrastructure and the recent literature on how to pay for it (e.g., Pagano, 2011, McNichol, 2016; McKinsey, 2017; Geddes, 2017; McBride, 2018; Schanzenbach, Nunn and Nantz, 2017). Second is the “fiscal squeeze” as the relative revenue productivity of the former “big three” (income, sales, and property) are being eroded due to a combination of short-term-after-short term direct discretionary tax base reductions and the long term effects of changing economic, demographic and institutional trends (Tannenwald, 2001; Brunori, 2012, Luna and Murray, 2015; Wallace, 2012, 2015). Third, in contrast to, or maybe due to, the present a citizen “anti-tax” mood, state and local policymakers have become more permissive to the enactment of local fees and charges (Sjoquist and Stoycheva, 2012) . And, fourth, the technology for employing new charges is improving particularly in

the area of motor-vehicle-related activities as revenue collection is facilitated --e.g., smart parking meters that allow governments to accurately monitor and report on the use of public spaces; GPS tracking of vehicle weights and distances driven, emerging modes of road and congestion pricing (Gifford, 2012; Basso and Duvall, 2013; Geddes, 2015).

Clearly, for purposes of revenue productivity user charges and fees matter. In addition, user charges matter since they best fit the “benefit (matching) principle” that state and local revenue policy should be designed so that the policy outcome is both efficient and equitable. As Bird (1996) advises with respect to the funding of infrastructure: “whenever possible charge”. Why? Because of their market price-like *quid-pro-quo* character, charges serve as both a rationing mechanism and a long term public expenditure planning tool. With respect to rationing, there is, for example, evidence that a greater the local reliance on user charges to finance government services leads to a reduction in municipal expenditures; and in the case of highway use, reduced congestion ( Sun and Jung, 2012; Fisher, 2016; Bliss, 2018). For similar *efficiency* reasons, the planner will turn to user charges to ascertain citizen willingness-to-pay that, in turn, can guide decisions regarding (i) the type and quantity of public services to promote or cut back on; (ii) determination of the determine the efficient price for a given service; and (iii) a methodology for estimating estimate the economic benefits generated (Gulyani, 2006)

And, at the same time, there is, at least conceptually, the outcome that in the direct *quid-pro-quo* direct charge case, the test of *equity* is met --that is, if the charge is well implemented (*inter alia*, a case for earmarking), those who benefit from a flow of services are the same person or group of persons who pay the costs of the service (Lindahl, 1919; Vickery, 1952; Bird, 1996; Musgrave, 2005).

There are, however, some important caveats to this equity and efficiency fit:

- Identifying “who benefits” is not a simple matter once one considers (i) the multiyear nature of life infrastructure assets and (ii) spatial considerations that make it difficult to assess those who are not direct users of service; that is, who realize net external gains (Fisher, 2016; Altman, Klein,

and Krueger, 2015; Bird and Slack, 2017a). One important policy implication of this reality is that in most (not all, as will be noted in below in this paper; also Kearney, Hershbein, Nantz, 2015) user charges do not fully cover operating costs; that is efficiency typically requires a combination of partial cost recovery from charges/fees and current taxation.<sup>3</sup>

- Varying by mode, charging brings with it tasks of compliance and administration in a manner that that have an efficiency cost (Vu and Ebel, 2016).
- The circumstance that even when the class of user beneficiaries is identified, the application of the flow-of-the benefit funding tool is so poorly designed and/or targeted that it blurs the distinction of a tax vs. fee<sup>4</sup>

Two final caveats, though in this case “alerts” might be a better way to put it, merit comment. The first is to note that user charge and fee “equity” has no income redistributive role; nor should it. However, as Musgrave writes (2005) and citing Wicksell (1896; 1958), the claim of equity requires the further premise that the distribution of income, out of which purchases are made and benefit taxes are paid, must also be just. To accomplish this sense of fairness does not require abandonment of the rationale for as a strict as practicable the application of benefit principle when instituting user charge policy, but rather argues for compensatory adjustments be made through other tax and transfer mechanisms.<sup>5</sup> The second matter to emphasize note is that the discussion in this paper is about funding infrastructure services. Edelman (2017) has documented that user charging for some non-infrastructure services can lead to some deeply perverse results, as in the case of fines and fees associated with the US court system.<sup>6</sup>

### Purpose and Scope

In order to understand and be able analyze user charge in policy and practice and the role of user charges in funding the flow of current services provided by the public’s infrastructure, one must first have a firm grasp on nature of the data and how it can be organized intergovernmentally.

Accordingly, the purpose of this paper is to focus on the pattern and performance of user charges as a source for paying for - that is, funding-- infrastructure services that are delivered to citizens through the highly - decentralized U.S. system of intergovernmental fiscal relations. The associated topics of (i) financing the public's capital, (ii) theory of user finance, (iii) price effects of user charging, and, (iv) implementing a user charge policy have been addressed elsewhere.<sup>7</sup>

### Organization

This presentation begins by establishing a set of knowledge preconditions that are presented in logical sequence of four steps that establish the framework for the subsequent discussion of the role of user charges in funding current infrastructure services:

- the need to be explicit as to what one means by the term infrastructure and how it can be empirically defined by an agreed upon set of types (modes) of infrastructure;
- that the topic is about paying for a flow of current services rather than adding to the nation's capital stock;
- why infrastructure funding in this context is primarily a state and local responsibility, and
- the terms by which one can explicitly define user charges as "current charges" in support of infrastructure (Part II).

The paper then proceeds to work through a set of descriptive and analytical discussions that are accompanied by tables and charts that reveal the highly intergovernmental nature of funding US infrastructure services (Part III). The paper concludes with a comment on short/medium term outlook for the use of user charges as part of a strategy for paying for infrastructure services (Part IV).

## **II. Terminology, Definitions and Data**

## Infrastructure and Its Modes

The first step in setting the context is to recognize that “infrastructure is notoriously difficult to define” (Orszag, 2008). Most often the term applies to some set of general government “hard” physical assets such as roadways, bridges, and sewer pipes (NCPWI, 1988; Ulbrich and Maguire, 2005; Bird and Slack, 2017). However, other treatments of the topic have included social and even intangible assets (Kim, 2016).<sup>8</sup> Moreover, infrastructure that has a “publicness” may be private or public—or some mix of both (Marlow, 2012; Siemiatycki, 2017).<sup>9</sup> Too, one geographical area may be served by a municipal or joint intergovernmental compact, whereas the same services in another area and privately supplied. For example, in the US there is public access to both publicly and privately owned highways, parks and recreation facilities, transit systems, and water and sewer authorities. The same type of infrastructure may show up in the public data base...or not.

For purposes of this analysis the decision has been taken follow the US Census Bureau definitions of the modes of state and local capital (“infrastructure”) and its associated funding streams.<sup>10</sup> There are two important reasons for doing so (Fisher and Wassmer, 2016). First, the Bureau applies a survey-based consistent definition across governments of what constitutes revenues and expenditures even though each type of government, federal, state and local, may in its own financial documents, categorize the stock of capital and flow of user charges revenues and expenditures differently.<sup>11</sup> This standardization allows one to make consistent statements across all the state/local systems overtime for an agreed set—and definition of—modes of infrastructure. Using the standardized Census definitions, there are twelve (12) types of infrastructure: education, hospitals, highways, air transport (airports), parking facilities; sea and

inland port facilities, natural resources, parks and recreation, housing and community development, sewerage, solid waste management, and “other” activities not falling in one of the other eleven functional categories. (*Census Classification Manual, 2006*).<sup>12</sup>

Second, Census standardization further allows one to make statements about the role of user charges in infrastructure funding by type of local government, which, as discussed in this paper are the 50 states plus the District of Columbia and the nation’s 89,004 local governments. (Census Bureau, 2012 and 2016).<sup>13</sup> These 89,004 local governments are organized in to one of five types: The first three are general purpose units and the next two are special purpose governments: counties (3,031), municipalities (19,522), townships (16,364), special districts (37,203) and independent school districts (12,884).<sup>14</sup>

#### A Flow, Not a Stock, Concept

A second step in setting the framework is to make explicit that when taking on the topic of role of user charges in funding infrastructure that the focus is paying the operating of infrastructure services. As used here, the term *funding* is a flow concept—matching the current flow of spending benefits to the users who pay for those benefits.<sup>15</sup> This is distinct from the payments associated with the *financing* of capital stock such as (i) special assessments that come the form of compulsory contributions collected from owners of property benefited by special improvements to defray the cost of improvements (e.g., street paving, sidewalks, sewer lines); (ii) developer fees, exactions, and in-kind investments (infrastructure that may be “on site” such as a sewer hook- up or an off-ramp to a developer’s facility or an “offsite” linkages such as requiring a developer to build and transfer a facility such as a fire station or school proximate to the development project); and, even (iv) payments for the right to name sports stadiums, transit stops,

and the use of public utility air rights (Fisher and Wassmer, 2016; Bird and Slack, 2017).

### A Topic for State and Local Government Finance

The third step in this sequence is to ask “which type of government or governments are functionally responsible paying for the flow of current infrastructure service?” Here the data show that from both a capital investment as well as capital ownership perspective that State and local governments are the stewards of the vast stock of the public’s infrastructure.<sup>16</sup> There are three considerations.

*Adding to the capital stock.* Using a mix of pay-as-you go current revenue, federal grants and primarily, long term debt (Kim 2016), one finds that the state/local sector accounts for nearly three- fourths (73%) of capital investment spending. Indeed, even when looking at the federal grant intensive water and transport sectors, the state and local sector is providing 62% of capital spending and 88% of operation and maintenance expenditures.<sup>17, 18</sup>

*Owning the capital stock.* Just looking at the capital investment numbers does not make the case that current funding of infrastructure is a topic of state and local finance. The more important question that needs to be addressed is which government sector, federal or state/local, is the owner of the US stock of public infrastructure?

The data is clear and convincing that when one examines the state/local vs. federal ownership shares of the net stock of total non-defense public assets in the United States, the provision of infrastructure in the US is primarily a state and local function. Upon examining the data for the net value of structures (one must exclude equipment), one finds that the state and local ownership—and thus the responsibility for operating and maintaining the nation’s capital—is 93% state and

local and 7% federal (Chart 1). Moreover, this is not a recent development. Throughout its history, the United States has had a fiscal culture that has assigned state and local government a dominant role of state and local governments in the both infrastructure construction and in coming up with the funds to pay for its flow of current services (Hughes, McDougall, and Davis, 1969; Walton and Rockoff, 2018.). A review of the data will reveal that the percentages shown in Chart 1 for 2015 have generally held since 1925 when the US Bureau of Economic Analysis (BEA) began tracking of fixed assets.

*Federal Charges and Fees.* Although the federal government has a long list of what it classifies as charges and fees, with few exceptions these charges are not for the purpose of funding the public's stock of physical infrastructure. There are four distinct types of federal charges and fees, including some of which Census categorizes as taxes: (i) *user fees* that fit the conventional textbook definition of a sum of money paid by an individual who chooses to access a public service or facility (e.g., national parks, camping grounds, canal tolls) along with payments for insurance premiums and charges for the use of federal land, such as grazing livestock; (ii) *regulatory charges* ranging from payments for testing and inspecting equipment and facilities to fees for securing trademark rights, operations of the Federal Communications Commission, food and drug inspection and fees, and charges that derive from the power of sovereign central state (e.g., passport issuance, patents); (iii) *benefit taxes* that mostly relate to transportation (e.g., fuel taxes dedicated to the Highway Trust Fund, a head tax on airport departures and arrivals that is dedicated to the Airport and Airways Trust Fund), and (v) *liability-based taxes* levied for the purpose of abating hazards or for compensating injuries (e.g., taxes on mining to fund the Black Lung Disability Trust Fund, a tax on vaccines dedicated to a Vaccine Injury Compensation Fund, and taxes on motor vehicle, aviation, and other fuels dedicated to the Leaking Underground

Storage Tank Trust Fund, which covers environmental damage clean ups). Richardson (2005).

### User Charges: Define and Measure

So far, so good. Now, how about just going to the textbook definition for a definition of “user charges” and moving on? Well, indeed, the textbook is the right place to start— a charge (and fee, the terms are used together here) is a price paid by an individual or group of people who choose to access a service or a facility. This is similar to the private market transaction *quid-pro-quo* “matching relationship” between payor for the cost of the service.<sup>19</sup> This general definition then narrows once one makes the further stipulation that the definition of charges as applied by the Census Bureau (and for purposes of data consistency is adopted in this paper) excludes the following:

- *General taxes*, which are compulsory payments to government without reference to the any specific benefits derived from government expenditures (Bird, 1976; Thuronyi, 2005).
- *Specific benefit taxes* as compulsory charges levied on a person or group of people who are assumed to be the principle beneficiaries of certain public services. Examples are motor vehicle licenses and motor fuel taxes paid by motorists as a class rather than in direct use of roads and highways, and the excise tax on an airline ticket.
- *Special assessments*, as noted above, are compulsory contributions collected from owners of property benefited by (capital) improvements to defray the cost of such improvements. These assessments are typically apportioned according to the assumed benefits to the property affected by the improvements and be paid either on a pay-as-you-go-basis or through payment of debt service on indebtedness incurred to finance the improvements.

- *Utility revenue.* A fourth Census Bureau exclusion from its definition of Current Charges is revenue from the sale of utility commodities and services to the public and to other governments. There are four utility sectors: electric power, gas supply, water supply, and mass transit (*Census Classification Manual*, 2006).

Unlike in the case of the first three exclusions bulleted above, each of which is linked to the capital construction stage of economic activity and thus for which there is a reasonably clear “bright line” between a capital and a current charge, the case for separate treatment of utilities is a more “blurred” than “bright” line since utility operations require users to pay for the current service in the same *quid-pro-quo* relationship that one associates with a user charge. Thus, there are fare cards at the mass transit system entry and/or exit gates, and, for water supply, connection and distribution charges. To make things even a bit more blurry the Bureau also makes it clear that even though it separates out utilities from its definition of current charges, what it reports as “utility revenues” are only the user type fees that are collected from its customers.<sup>20</sup>

It follows that in a strict application of the definition of user charges, then utility revenues would be so classified. However, to include utilities along with the twelve modes of infrastructure would be problematic. Utilities (like liquor stores) are operated as enterprises and as such are accounted for separately state and local budget accounts—not as part of general government. Moreover, since most utilities in the US are investor-owned and operated (thus also not part of general government) and generally self-supporting through grants from “sponsoring” general purpose governments, sale of services, and return on own investments, to treat the sector in as a general government purpose activity would distort the infrastructure mode data.

Accordingly, for purposes of using an intergovernmentally consistent set of data on how

governments employ user charges for paying for the flow of publicly provided infrastructure services “user charges” refer to, and are measured by, the Census definition of *Current Charges*:

Amounts received from the performance benefiting the person charged, and from sales of commodities and services except liquor store sales. Includes fees, assessments and other reimbursements for current services, rents and sales derived from commodities or service furnished. Current Charges exclude intergovernmental revenues, interdepartmental charges, license taxes (which relate to privileges granted by the government) and utility revenues (US Census Bureau, [www.census.gov/govs/local/definitions.html](http://www.census.gov/govs/local/definitions.html)).

Note that this definition encompasses three important features. The charges are (i) “own” revenues; (ii) part of a current/operating budget, and (iii) payments for a flow of governmentally provided infrastructure services. The types (modes) of infrastructure for which the Census classifies current charges are the 12 identified above in the discussion relating to the definition of infrastructure (Box 1). Box 2 illustrates the types of charges associated with each of twelve categories. These 12 modes associated with current charges are the same that Census uses to report capital outlays.

### **III. The Numbers**

*Current Charges* are important not only due to their growing share of state and local General Revenues Generated (16.5%, Table 1) but also, as noted in the Introduction, can be designed to meet the twin tests of equity and efficiency. Moreover, they can be tools for making more effective and transparent public sector regulatory policy ranging from that of monitoring “small”

local activities such as rip-rapping an environmentally protected shoreline to that of the use of the state and local owned and managed the interstate highway system.<sup>21, 22</sup>

The remainder of this section presents a set of tables and charts that are as revealing as they are arcane regarding the use and trends of current infrastructure charges. The purpose is to provide both a general knowledge base and the intergovernmental story of the role of infrastructure user charges. To facilitate all this, the presentation is organized on a table-by-table format whereby the information in each table draws on those previously presented. Thus, the discussion begins with a presentation of how current charges fit into the total state and local system of General Revenues and then proceeds to present current charges (CC) by type of infrastructure, the trends over the past two decades, and the numbers for both the state and local sector as a system, which are then further broken down into state vs local, and then within the local sector by type of government. This empirical work concludes with a look at how the degree to which state/local current charges are correlated with state per capita income and measures of state revenue capacity and effort.

### **Current Charges in the State/Local General Revenue System (Table 1 and A1)**

To start to lay out the role of current charges in infrastructure finance, Table 1 provides a two-decade perspective as to the quantitative importance of charges relative to total state and local general revenues as well as to the other major revenue categories. The table presents the US\$ amounts and the ratio of current charges to total general revenues by both type of general revenue category and for three representative years (1993, 2002, and 2013).<sup>23</sup> Right at the start, there are some interesting findings:

- For 2002 and 2013 total CC collections are greater than the sum of the collections from

individual plus the corporate net income tax. The data show that total CC exceeded the individual plus corporate income taxes for the period 1994 through 1996; and then fell to less than the income tax sums in 1997-2001. Whereas the growth total CC has been a consistent feature since 1993, the income tax combination has been volatile. The income tax numbers further attest to the findings elsewhere that at the same time the current charges are increasing as a share of own source revenues, the corporate net income tax is disappearing from the state revenue scene: from a high of about 9.5% in 1997 to less than 4.0% in 2013.<sup>24</sup> Moreover, over the period shown, total current charges have not only been increasing relative to Sales and Gross Receipts (the ratio of CC/Sales and Gross Receipts has increased from 71% in 1993 to nearly 90% in 2013), but also surpassed the yield of the General Sales Tax. And, as of 2013, total current charge collections are approaching parity with the property tax.

So much for the conventional public finance wisdom that the taxes on income, sales and gross receipts, and property make up the “big three” of state and local own source revenues.

- A large part –but, as will be shown, not all—of the explanation of the growing importance of current charges relative to total General Revenues (from 14.3% in 1993 to 16.5 % in 2013) can be attributed to two categories, Education and Hospitals--that when taken together have increased from 9.8 % of total state/local general own source revenues in 1993, to 10.4 % in 2002, to 11.8 percent in 2013 (latest years that such detailed data available).As for the changing mix of Education and Hospitals, “Big Med” has grown faster than “Big Ed” over this period studied
- Before moving along, one last comment is merited, which goes back to the introductory discussion on why, when looking at the user charge infrastructure topic, settling in on the

Census definition of charges works. If one accepts the view that a broad definition of infrastructure user pricing should add in motor fuel taxes and licenses along with special assessments, it turns out that even with this broader measure, current charges will still dominate the discussion (Table A1).

### **Current Charges Generated by Type of Infrastructure Service Flows (Table 2 and Chart 2)**

The next step is to pull the current charges data out of Table 1 and begin the examination of the charges as a state and local revenue source arrayed by type of infrastructure service. This takes one to Table 2 and Chart 2. And again, there interesting findings. The first, which is also reported (but with a different data context) in Table 1, is that Education and Hospitals are the major sources of current charge revenues. In 2013 the two categories combine to make up more than half (55.7 %) of total CC collections. The same relative magnitudes are shown when one calculates the ratios of charges to either General Revenues or General Own Source Revenue (hereafter, referred to as “own source” revenue, OSR). To get a sense of why this is true, it is helpful to take a glance back at Box 2, which illustrates the type of current charges by mode of infrastructure.

So, education, and, especially, higher education, dominate the discussion; that is, until one goes to the far -right column which shows current charges by mode as a percent of current expenditures. Now one gets quite a different picture of the relative importance of current charges. Whereas current charges relative to current expenditures are seen to be important relative to total spending on higher education (39%), what shows up is the high importance of current charges to the state and local expenditure components of funding other infrastructure modes—in fact, several of them: hospitals 81%, air transport, 97%, sea and inland waterways, 85%,

sewerage, 94% and solid waste management (69%). And, parking facilities, 144% (Chart 2).

The Parking Facilities percentage allows a nice transition to two further points that one should keep in mind when looking at the current charges data.

- First, one should not assume that just because a user charge is infrastructure service related and that the revenue payer-user matching principle is satisfied, it will therefore follow that the revenues from the charges collected are, in fact, then budgeted to support the services from which the user charge has been derived. Whether or not charges are dedicated to a specific infrastructure mode is a decision made at the discretion of the state legislature, local council, or a legislatively empowered instrumentality (e.g., a special district authority).
- Second, when looking at the CC as a percent of current expenditure columns, it would be not unreasonable to assume that most, or all, of the CCs for parks and recreation, sewage and solid waste management are being tagged for the service from which the user charge was derived. But a look at the Parking Facilities ratio shows that the use of user charge funds exceed the expenditure made on the activity. In the case of parking, receipts may be directed to special fund support (e.g., in the example of the District of Columbia a fund for making transfers to a tristate DC/MD/VA mass transit fund) and/or the General Fund (Clark, 2016).

### **Current Charges Trends Overtime and By Mode (Tables 3, 4, 5, 6)**

The next set of data presentations takes a closer look at CC performance by moving on to look at the trends in revenue flows over the past two decades, and, again, selecting the representative years 1993, 2002, 2013. The first set of Tables, 3 and 4, look at the changes in revenue collections,

by mode, breaking out the numbers to show the nominal change in US\$ generated over the time periods 1993-2002 and 2001-2013. *Inter alia*, the data shows that—not at all unexpectedly—the revenue flows by mode were not static over the time periods examined. Thus, one observes that during the 1993-2002 period, CC from sewerage, hospitals, airports and highways led the other seven categories.<sup>25</sup> But, for the more recent decade user charges from hospitals, parking, sewage and highways outpaced the other sectors. Over the entire two-decade period, revenues generated from the activities of solid (and hazardous) waste management, natural resources, and housing and community development increased more slowly than other sectors (Table 3).

Turning to the trend by mode data when current charges are expressed as a percent of expenditures (Table 4), one sees a different ranking order in terms of which services have generated user charges. Again, recognizing that one cannot assume a 1:1 mapping between user charges generated by mode and expenditures by mode, a comparison of the rankings of where the money may have gone (Table 4) shows some consistency: hospitals, highways, sewerage, airports, and parking as a likely source of both revenues generated and revenues expended.

What are the policy conclusions and statements that can be derived from these trends? There are at least two. The first is that to understand these cross-sector trends requires sector studies. That said, there is no apology being made not taking that sector-by-sector study step here; rather, the numbers shown should give sector analysts a start on their work.

Second, the CC revenue flows reflect both the demand and supply of the infrastructure service category. That revenue flow from hospitals are shown to be increasing over the two decades could reflect several demand variables, perhaps chief among them, the aging of the population (Gais,

Boyd and Dadayan; Penner, Wallace—all 2012). To identify the supply side variables experts (e.g., McNichol, 2016) point to growing deterioration of infrastructure services, which results in the need to address increasing costs of operation and maintenance (the supply curve shifts up and to the left). Other factors –e.g., the increasing use of transponder technology in collecting roadway tolls may also help explain why highways rank at the high end when listing user charge revenues (supply shifts down and to the right; quantity demand increases).

The information in Tables 3 and 4 comports with the Table 1 information on the increasing *relative* importance of Current Charges *vis-à-vis* other state and local revenue sources suggested. The next task is to examine the CC trends in real dollar terms (Table 5 and 6.) And here the data show that for all infrastructure modes, CC revenue flows have increased. For the two-decade Period 1993-2013, the real revenue flows increased 3.12 % above the general rate of price change.<sup>26</sup> The above average sectors—familiar from both Table 1 and Table 3— are sewerage, hospitals, and air transport, and highways.

### **Decentralizing the Data: First, State vs. Local (Tables 7 and 8)**

The next step in dissecting the nature of CC revenue distribution by mode and over the past two decades is to break out the state/ local system numbers by (across) state vs. local. The theory of user charge pricing --- that charges have a clear benefits-area character—suggests that by making this state vs. local split one should learn a bit more about how the benefit area matching principle is playing out spatially. And, indeed, the matching principle is the practice as shown for not only for the most recent data (2013, Table 7 and Chart 3), but also overtime (Table A2). The small area services of housing and community development, sewerage, and solid waste management and parking are overwhelmingly local and the services that have a multijurisdictional character

(natural resources, highways, and the higher education-driven category of educational, natural resources, and highways) are tilted to the state-only column. As for airports, nearly all are local and typically administered as a special district. This pattern of what is shown to be the state vs. local share in 2013 (Table 7) is true when one looks at the same data over the past two decades (Table A3).

A different take on state vs. local user charge distribution is presented in Table 8 and Chart 4 that look as the distribution of revenue charges within the state and local sectors. With education (again, higher education dominates) along with hospitals, 80 percent of state current charges are explained. Highways—local roads-- are also important to the local sector budgets (30%), as are sewer charges (19%).

### **Decentralizing Locally (Tables 9, 10 and 11)**

In getting a sense of how the highly decentralized US federation works, and recalling (Table 7) that together the 89,004 local governments in the US account for nearly 60% of CC collections (Table 7, 58.7% ), a detailed look at how the various types of local governments as users of user charges works is revealing.<sup>27</sup>

There are two ways to dissect this data. The first to examine the percentage share of how, for the country as a whole, total current charges collected are distributed among the five types of local governments: counties, municipalities, towns and townships, independent school districts, and other special districts (Table 9). The second is to look at each type of local government, and then ask how important current charges are relative to the own source revenues of that type of government.

Total CC collections by type of local government. The data on how the percentage shares of current charges collected break out by region is presented below (Table 9).<sup>28</sup> The four US regions and their divisions are: **Northeast** (New England and Mid-Atlantic); **Midwest** (East North Central and West North Central); **South** (South Atlantic, East South Central, West South Central), and **West** (Mountain, Pacific). As Table 9 table shows:

- Across the country municipalities are the most intensive users of current charges, but, even with that, there is variation. Municipal governments are least important in the South.
- Counties are the second largest user/collector with an average collection percent of 27% compared to the municipal 40%. Now one observes that the South relies on counties more that do the other regions.
- Though special districts account for the largest number of types of local government, they account for only a fifth of total current charges generated.
- And, the percent for school districts (the second lowest of the 5 types, at 8%) confirms the largely tax and grant financed support for elementary education.

Current Charges Expressed as a Percent of OSR by type of local government. There are several further findings one can glean by looking both down and across Table 10 (by region only) and Table 11 (by region and state). Here are some of the interesting features of the CC revenue flow.<sup>29</sup>

- The top row of Table 10 shows the percentage of total own source that each separate type of local government generates from current charges. To get a sense of how things work by type of local government and by regions and regional division-- go down the rows.<sup>30</sup>
  - Across the country, current charges generate close to the same proportion of total own source revenues: for counties (31%) and municipalities (28%).

- Townships, which are characteristic of the “old” regions of the country (as one goes West states do not have township government), rely on current charge revenues in the Northeastern and Midwestern states. To identify the states, see Table 11.
- Special Districts are, as intended when established by a General - Purpose government or governments, are heavily reliant on user funding. These numbers further support the case that, spatially, the matching principle is at work.<sup>31</sup>
- School Districts, which are largely tax and grant financed, are classified as either *dependent* or *independent*. Dependent school systems are part of county, municipal, township or state government and are not counted as school district governments for Census purposes. Of the 14,178 school systems in the US (2012), 12,880 (91 percent of the total) are independent and are thus included in the school district data of current charges. Charter schools, which are publicly funded independent schools under terms of a charter with the establishing state/local government authority (thus a government entity) are included in the school district data. (Census Bureau, *Individual State Descriptions, 2012*).

Table 11 presents the same ratios --the ratio of current charges to OSR within the budgets of different types of local government —but then take takes a look in state-by-state format.

For those interested in this sort of fiscal decentralization data, it is both a very rich and hard

to interpret data set. To illustrate

- For Connecticut, note the zero entry under the Counties column. Effective October 1, 1960, Connecticut county government was largely abolished and county functions were transferred to the state government (boundaries have been retained for election of county sheriffs and for judicial purposes). Towns in Connecticut provide the services that are associated with counties and municipalities in most states.
- Connecticut, Massachusetts, and Virginia show high school district reliance on current charges. But, here special caution is advised in interpretation because of data anomalies that arise because for the different states (i) education agencies collect data at different levels of detail and (ii) a state's mix of dependent vs. independent school systems will influence ratios of CC/School District own source general revenues. For example, in Connecticut the entire area of the state is encompassed by town areas, which are counted as towns except for areas in which the town is consolidated with a city or borough government. Under this arrangement 87% of schools are dependent; the other 13% are independent regional schools organized by a joint action of two or more towns after a referendum. Census designates these regional schools as independent. Fiscal needs are determined by a school board that apportions costs to the participating towns. This distorts the data which in this case (82% user charge reliance) reflects the arithmetic of a low General Revenue denominator.

- Massachusetts has 327 public school systems, but only 84, which include some regional and independent vocational-technical schools are counted as separate governments. Virginia, has 136 public school district governments, only one of which is independent.<sup>32</sup> In Hawai'i and Alaska schools are fully state funded.

So, there is a warning in interpreting the data especially when making interjurisdictional comparisons of user charges. When observing an out-of- out-of-line school district number, it is a good idea to delve into the detail of the intergovernmental organization of the state before drawing any policy conclusions.

### **Correlation Coefficients (Table 12)**

Having dissected the CC numbers by type, trend, mode, and for different forms of government, a last step was to ask the question: do current charges for infrastructure finance vary significantly when one looks at the broader aggregates of state income and revenue capacity and revenue effort? In order to get some at some answers, eight Spearman's rank-order correlations were run. The first set examined the relationship between state and local current charges as percentage of own source revenue and direct current expenditure with state per capital income. A second set of two rank-order correlations were calculated to learn if there is a systematic relationship between states' use of current charges for infrastructure and recently released estimates by the Tax Policy Center (Gordon, *et. al.*, 2016) of measures of state-by-state revenue capacity and revenue effort. The results are provided in Table 12.

The Spearman's rank-order test gives one a correlation coefficient in the range of values of (-1 to +1. A negative (positive) sign indicates an inverse (direct) relationship between the data sets being

tested. For purposes here, it was necessary to initially develop two sets of state- by- state rankings (Table A4). The first set is the ranking of all 50 states and DC for their use of current charges as a percent of own-source revenue, and then take the next step to rank all the states by (i) an economic measure (per capita income) and then (ii) fiscal measures (revenue capacity and revenue effort).

*All states and all current charges.* In the first case—testing the relationship rank-correlation of the use of CC and per capita state income for all 50 states and the DC, the rank correlation coefficient comes in at -0.5943 with a confidence level of 99%.<sup>33</sup> This allows one to assert that a negative relationship exists between the two variables. That is, that the higher (lower) a state ranks in per capita income, the lower (higher) such state ranks in current charges as percentage of own source revenue.

The same negative and significant relationship shows us when Current Charges as a percent of direct current spending relative to state per capita income. While this appears to “fit” with the All States revenue and per capita relationship, one must, as noted above, be careful to not make a 1:1 match with the CC revenue finding to spending. As noted above, whether user charges for paying for infrastructure services are, in fact, allocated to an infrastructure mode is a political decision that will be influenced by the availability of alternative funding options.

*States without a broad - based income or sales tax.* With these results the question then arose as to whether one might find a the same or a different result for three fiscally sub-groupings of states; that is, what would be the rank correlation if one omitted from the list of states (i) the seven that do not levy a broad based personal income tax states (Alabama, Florida, Nevada, South Dakota, Texas, Washington, and Wyoming); (ii) the five non- sales and use tax states of Alaska,

Delaware, Montana, New Hampshire, and Oregon; and then (iii) a combination of these two sets of states (CCH, 2015).

The findings for all three cases were essentially the same as for “all states”— the use of current charges is inversely related to per capita income and significantly so. Among these four cases, the strongest correlation (-0.6311) was found using the sample of all states excluding the both non-income tax and non-sales tax states.

*All states excluding hospitals and education.* Recognizing that in the CC data that not only to Education and Hospitals taken together dominate the CC data, but also that the Education data is largely explained by higher education (85 percent), rank correlations were run excluding these two general sectors from the charges data (from both the Current Charges the numerator and Own Source Revenue Denominator). The finding is that now although there still a negative relationship between reliance on user charges and state per capita income the relationship fails the test of significance. That is, when one considers only the “physical infrastructure” one cannot make a robust statement that there is higher reliance on user charges in low per capita income states.

Why this is the case is beyond the scope of this report. That said, one can hypothesize for future work that what one is observing may reflects a public choice decision: when policymakers turn to user charges as a source of funding, they are relatively more reluctant to turn to user charges on activities for which there is seen a significant element of services for which there are general benefits to their public, and instead turn to charges on those taxpayer citizens who have an ability to shift the cost of the charge to other sources of payment.

This service users ability to shift the cost of user charges would seem to be particularly true for hospital services, the initial payment for which, for some, can be offset by private or public

insurance (for example, in the latter case Medicare). A similar way of thinking may be at play for higher education if the policymaker views users of higher education as relatively high permanent income persons, who, in turn, can turn to (i) family savings and /or (ii) debt finance (student loans) and thereby defer the user charge payment requirement until one realizes a higher expected income in one's post-higher education days.<sup>34</sup>

Three other factors may come into play with explaining the trend to increase in higher education tuition. The first is that the US has a long history—introduced in the late 18<sup>th</sup> and early 19<sup>th</sup> century—of charging tuition and fees (room, board, books, clothing) as part of a system of private and publicly subsidized colleges and universities. The second is that today's tuition-levying policy makers are acting on incomplete information by failing to recognize that there are externalities (e.g., research) in higher education (Fisher, 2016). The third is that unlike most of the other modes for which current charges are made, higher education has much more voluntary character—unlike, for example, elementary education, which is mandatory.

Revenue Capacity and Revenue Effort. Having the results for per capita income, the next step was to rank-order the 51 states (including D.C.) as a (i) current as percentage of own source general revenue and the (ii) state revenue *capacity* by using the standardized Representative Revenue System, RRS, as developed earlier this year by the Tax Policy Center (Gordon, *et. al.*, 2016); Here the analysis reveals a negative and significant rank correlation coefficient: - 0.6248.

But, when calculating a rank-correlation between use of current charges and revenue *effort* (actual revenues collected/revenue capacity), the rank-order correlation was not robust.

So, what can conclude from all this? At least two things. First, one can say with confidence that their reliance on the use of current charges in support of the funding of infrastructure flows is a

policy that is significantly associated with states that have (i) lower per capita income and (ii), too, as one might expect from the per capita income data, a lower capacity (the standardized RRS) to generate total revenues.

Moreover, a review of Table A4 allows one to make supporting some statements regarding user charge policy on a state- by- state basis. The anecdotal evidence is there: Mississippi ranks 51<sup>st</sup> in per capita income and 3<sup>rd</sup> in use of current charges. Ohio is ranked 31<sup>st</sup> in per capital income, and 28<sup>th</sup> in use of user charges. And New York in 6<sup>th</sup> in per capital income and 48<sup>th</sup> in use of charges.

But, second, as Fisher (2016) warns, one should not be too quick to make a state-by comparison regarding the use of current charges; or, at least be very careful in doing so. As discussed above (Table 2) education and hospitals dominate the data that shows the relative importance of current revenues to a common denominator such as general revenues from own sources. In 2013, these two categories accounted for 55.7% of current charges (Table 2). Thus, whether or not a state has large public hospital and/or public education facilities (and in the case of education, a small or large system of higher education) will affect the state CC rankings. So, whereas the rank correlation findings presented here are of merit—and they do allow one to make a general statement regarding income and revenue capacity as has been done-- just be careful in leaping into a state- by -state discussion.

The finding that there is not a significant rank correlation between the use of user charges and the total revenue effort comports with the alert that one cannot leap to a statement that because a set of states may not use one or both of the broad-based state taxes (income and sales), these states will turn in a significant way to the use of current charges. Just as above it was noted that caution

is advised due to the fact that states have different mixes of user charge related infrastructure services (Alabama is not Alaska; South Dakota is not South Carolina), they also have different ways of how they substitute other tax sources for those broadly levied on sales and income. Thus, Washington State does not have an individual income tax and New Hampshire eschews the general sales and user tax, but both turn to a much broader business entity tax (Washington's tax on gross receipts, New Hampshire's on value added) than do the other states.

This all said: as a group, the states with higher per capita incomes and higher revenue capacity rely less intensively on current charges in funding infrastructure services.

#### **IV. Concluding Comment**

As the data, have shown the US use of user charges in support of local funding of infrastructure has risen in real terms over the years examined (1993—2013). Moreover, this growth and pattern of funding the flow of infrastructure services is a state and local story.

Whether this historical practice will continue or whether there will be some dramatic changes over the next years is difficult to pin down. It is reasonable to expect that the relative federal (largely grant-making) and state/local (generating current charges) roles will not change--- the federalism, history, and institutions are well established and working. If there is any significant uncertainty it has to do with whether the federal sector will continue to be a partner in infrastructure policy or become more and more what one observer has noted is an army (defense spending) with an insurance company.<sup>35</sup> Of particular concern is the long-term outlook for that increasing federal entitlement spending will crowd out federal infrastructure spending (Penner, 2012; Ebel, Peterson and Vu, 2013).

But, that said, there are some developments that are occurring—indeed, arriving at a very quick pace— that even if the federal/state and local balance does not change, the sources and uses of state and local infrastructure user charges may seem some important changes. To consider:

- **Education:** Systems of higher education, which, as demonstrated, account for most of the current charges in the education sector, are under growing political scrutiny, especially when it comes to the matter of tuition levels at both four and two year institutions. This may be changing, at least for two-year community colleges. As of January 2018 twelve states have newly instituted programs for some form of general tax subsidy to offset some or all of community college tuition and fees (Mercer, 2018).<sup>36</sup>
- **Hospitals.** If one is looking for a robust literature on US public policy, just turn to the topic of growing US health care system costs---costs that are often paid for by user charges (paid both directly by the individual user and her or his insurance plan). If these costs cannot be controlled—the next few years will be telling—hospital user fees may exorbitantly increase. Whether new health care technologies will reduce costs, and thus, the user fee cost recovery revenues, is not known. Suffice it to say, expect little slowing of hospital spending, and, thus, fees and charges in the near US future (Hall, 2017).
- **Highways.** It may be that the bad news regarding the stresses inherent in US highway user tax finance may lead to an increase in user charge finance. Although due to a combination of more efficient motor vehicles and, for now, low oil prices, motor fuel taxes appear to be in an inexorable real dollar downward trend, new highway transponder technologies appear to have great promise to generate increases in current/ user charge revenues. Potentially important developments are the expanded use of

dynamic pricing for highway as well as local road access; increasing acceptance of congestion charges, and the a more aggressive use fees based vehicle miles traveled and road usage differential road usage weight-distance charges.

- Parking Facilities. Again, new technology has is promises. Now with new software, some cities can monitor the demand for parking on a real-time basis and, when the congestion begins, automatically peak load pricing on a block-by-block basis.
- As for the other eight types of infrastructure—it's hard to say. For perverse reasons sewer charges for operations and maintenance can be expected to rise in the absence of new capital (largely debt financed) outlays. Otherwise, one should look to a more creative and intensive use of types of charges and fees as described in Box 2 may contribute to an increase in charges.

As a final comment, the US can expect to see continued real increases in current charges combined with a combination of some dramatic charge-enhancing activities along with just slogging through with existing practices.

## Endnotes

<sup>1</sup> Robert D. Ebel is former Deputy Chief Financial Officer and Chief Economist of Washington, DC. Yameng Wang is an economist with the Macroeconomics, Trade and Investment Division of the World Bank. The authors wish to acknowledge the advice and comments of Sarah Andersen, David Allen Clark, Catherine Collins, George Guess, Bartley Hildreth, John G. Hoeschler, Ronald Fisher, Joseph Pennachetti, Jim Regimbal, David Sjoquist, Enid Slack, James Spaulding, Leslie A. Steen, Selbe Tibeau, and Robert Zuraski. A special acknowledgement is also due to Richard Bird and Elliott Dubin who reviewed draft after draft of the paper, and to work of the expert practitioners in the Governments Division of the U.S. Bureau of the Census. The views expressed in this paper are solely those of the authors. An earlier and less arcane version of the topic of this paper is included in Bird and Slack's set of international papers on *Financing Infrastructure* (2017).

<sup>2</sup> To put these percentages in further perspective it is useful to note that the Bureau of the Census classifies four of the following state general business taxes (Ebel, Luna and Murray, 2016) under the sales and gross receipts category: The Hawaii General Excise Tax as a gross receipts and sales tax (Census Classification T09); New Hampshire's Business Enterprise (value added) Tax is under other selective sales taxes (T19); the New Mexico's broad based gross receipts tax is classified as gross receipts and sales tax (T09), and Washington's Business and Occupations Tax is a sales and gross receipts tax.

<sup>3</sup> Keamey, Hershbein, and Nantz *et.al.*, report that of the more than 1,800 mass transit systems in the United States—including those running trains, buses- only about two percent report fare revenue exceeding operating expenses in 2013. Indeed, the set of beneficiaries from mass transit system are diverse and dispersed: e.g., ranging from the lower congestion costs accrued by non-transit users (motor vehicle drivers) to the owners of property along the transit lines whose property (and, thus, rental) values increase. Of course, it is not just about mass transit. *Inter alia*, focusing on the question of external costs and benefits, Mak (2004) examines the role of user charge and tax funding of tourism related infrastructure.

<sup>4</sup> As in the case first Baptist Church of St. Paul, *et al* vs. city of Saint Paul (2016) whereby the Minnesota Supreme Court held that St. Paul's right-of-way assessment (RoW) thirteen year old user fee is appropriately a (broad based) tax and not a fee. Among the arguments the Court noted was that RoW was imposed on more than 81,000 St. Paul properties (i) benefiting the community at large benefits by providing 32 separate city services (ranging from street sweeping and plowing to maintaining street lighting systems and picking up litter) so as to allow everyone to be able to navigate on a well-maintained transportation network the and that (ii) a key feature of the RoW program was that it was imposed nearly city-wide, benefiting largely the general public traveling the rights of way. The Court also found that the fee had been imposed under statutes relating to its taxing and not its police power. References: Discussions with John G. Hoeschler, PA, for the appellants; and Duggan and Claypool (2017).

<sup>5</sup> This said, Pagano (2011) notes that with the emergence of new technologies (e.g. road pricing), local officials can and should look to ways to include a ability to pay feature in infrastructure pricing such that those who cannot afford the user charge and may be excluded from the use of an infrastructure facility. As an example he notes that low-income workers who must travel long distances may be shut out of job markets. In an ideal policy world, this sort of "safety net" adjustment would be funded not by tinkering with the structure user charges, but taxing/charging those in the employment center who benefit from having ready access to a workforce pool and/or expenditure policies such as affordable housing.

<sup>6</sup> In addition to Edelman (2017) see the Proceedings of the Yale Law School Liman Colloquium on *Who Pays? Fines Fees, Bail and the Cost of Courts*. Forthcoming, April 2018.

<sup>7</sup> E.g., (i) Munnell and Cook, 1991; Gramlich, 1994; Fisher and Wassmer, 2014; Dannin and Cokorinos, 2012, Gifford, 2012; Marlow, 2012; 2016; Kim, 2016; Siemiatycki, 2017; (ii) Lindahl 1919. Mushkin and Bird, 1972; Downing, 1999; Bailey, Falconer and McChlery, 1993; Sjoquist and Stoycheva, 2012; (iii) Fisher, 2016, Bird and Slack (2017); (iii) Fisher, 2016; Sun and Jung, 2012; (iv) Slack and Tassonyi, 2017.

<sup>8</sup> In the *Handbook on Urban Infrastructure Finance*, Kim (2016) identifies a list of economic sectors that "generally include" transportation, water and wastewater, education and healthcare, plus the power and energy, telecommunications, petroleum and mining, chemical, petrochemical, pulp and paper, metal processing, and cement sectors.

<sup>9</sup> In his testimony, Orszag breaks down, by category, the public (57.3%) vs private (42.7%) split on capital spending on infrastructure. The bulk of private capital investment, 78.4%, is for energy and telecommunications systems. Schools account for and added 13.5 % private infrastructure spending.

<sup>10</sup> Census Bureau, 2016, [www.census.gov/govs/local/definitions/html](http://www.census.gov/govs/local/definitions/html). Hereinafter the US Bureau of the Census will be referred to as the Census Bureau or Census.

- <sup>11</sup> Unlike all state and most local governments, the US federal government does not have a capital budget.
- <sup>12</sup> For discussion and application with respect to state local fiscal comparisons, see Bourdeaux, 2015. For funding public capital, Dannin and Cokorinos, 2012; Fisher and Wassmer, 2015; and Kim, 2016.
- <sup>13</sup> The sixteen US Territories each with its own governing structure are not included in this discussion. [https://www.census.gov/history/www/programs/geography/island\\_areas.html](https://www.census.gov/history/www/programs/geography/island_areas.html)
- <sup>14</sup> In aggregating, the Census will assign joint activities [(e.g., city-county hospitals to one or more of the cooperating jurisdictions following a set of standardized rules whereby Census considers factors such as the magnitude of financial (e.g., "substantial authority") or employment activity by cooperating jurisdiction. (Census Classification Manual, 2006, sec 3.14 and 114). A state by state description is published at five year intervals (US Bureau of the Census, *Individual State Descriptions, 2012*/issued September 2013). Tribal governments are recognized as sovereign nations under the auspices of the federal government and therefore do not meet the definition of a state or local government.
- <sup>15</sup> Some experts refer to "financing" as the extent to which the flow of infrastructure finances are subject to current charges as distinct from the "funding" of replacing and extending the capital stock, including earmarking to pay for current expenditures for administration, debt servicing, and repair. Others refer to "funding" as specific to the capital construction process. Still others use the two terms interchangeably. In all cases, user charges may contribute to both. As Bird and Slack note (2017), what is important in this matter is to make clear how the terms are being used.
- <sup>16</sup> McNichol, 2016.
- <sup>17</sup> The 73%-- 27% split is for 2004 data provided in CBO Director Peter Orszag's s testimony before the Committee on Finance, United States Senate, July 10, 2008 (Orszag, 2008). In his testimony, Orszag also breaks down, by category, the public (57.3%) vs private (42. 7%) split on capital spending on infrastructure. The bulk of private capital investment—78.4% is for energy and telecommunications systems. Schools account for and added 13.5 % private infrastructure spending.
- <sup>18</sup> The 77% state and local figure is reported for 2014 in the CBO (2015) report on *Public Spending on Transportation and Water Infrastructure, 1956 to 2014*.
- <sup>19</sup> Note that the question of whether the payment is compulsory or voluntary is not relevant here. Also see the discussion by Henchman (2013).
- <sup>20</sup> [www.census.gov/govs/www.class](http://www.census.gov/govs/www.class)
- <sup>21</sup> Too high a charge can go badly—for example, a pursuit of an attempt at full cost recovery may result in a resulting decline in quantity demanded that creates deep and broad negative externalities thereby reducing the net economic productive and social benefits promised for a project (e.g., Gulyani, Talukdar, and Kariuki, 2005).
- <sup>22</sup> The 46,876 mile interstate highway system, the construction funding of which has been a 90-10 federal-state matching is owned by the states and for some segments local authorities. The states establish operating rules and requirements (e.g., speed limits) and are responsible for toll collection and enforcement. Initially intended to be free of tolls, federal law still prohibits states from establishing tolls; but waivers are allowed for highway sections the state initially owned, when a state expands the system and/or makes other improvements such as the introduction of high-occupancy toll lanes (HOT lanes). The tolls that are collected are designated to retire bonds, and pay for bond debt service and other operating and maintenance costs. [www.fhwa.dot/interstate](http://www.fhwa.dot/interstate).
- <sup>23</sup> General Revenues include all revenue except liquor stores, insurance trust, and utility revenue (Table 1). The basis for distinction is not the fund or administrative unit receiving particular amounts, but rather the nature of the revenue sources concerned. US. Bureau of the Census, [www.census.gov/govs/local/definitions.html](http://www.census.gov/govs/local/definitions.html).
- <sup>24</sup> Brunori, 2012; Census Bureau, 2013. This state and local ratio (general revenue from corporate income taxes/total general revenue from own sources) as declined to 2.6 percent in 2015 (Census; 2015). To keep these ratios in further perspective, refer to Endnote 2, which notes that Census classifies state general business taxation entity taxes under sales and gross receipts rather than as a tax on corporate income...
- <sup>25</sup> The "Other Charges" category, though shown in the tables, is omitted from this ranking discussion.
- <sup>26</sup> For this purpose, the CPI-U index as used. However, in carrying out sector studies of capital investment, one can draw on sector price indexes provided by the US Department of Commerce. <https://www.census.gov/econ/construction>
- <sup>27</sup> For a breakdown of the functional roles presented by Direct General Expenditures by type of US government, see table A8 (net of capital outlay) and A9 (including spending on capital outlay)
- <sup>28</sup> US Bureau of the Census (2016). [www.census.gov](http://www.census.gov).
- <sup>29</sup> See Tables A5 and A6 for a break-out of the expenditure data.
- <sup>30</sup> The US Bureau of the Census, Census of Governments provides a state-by-state detail of all forms of state and local governments. US Bureau of the Census, *Individual State Descriptions* (2012).
- <sup>31</sup> Special Districts are independent, specific purpose units that exist as separate entities with substantial administrative and fiscal independence. In most cases (90% of the total) these are single purpose entities that provide education (e.g., libraries), social services (e.g., hospitals, public welfare, health services), transportation (e.g., highways, airports,

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parking facilities, water transport and terminals,) public safety (e.g., fire protection), solid-waste management; public water supply, sewerage and sanitation services, and natural resource services ranging from irrigation and drainage to flood control and soil conservation. Multiple –function districts typically have some degree of water supply function. Census Bureau, *Special District Governments*, 2002, 2012

<sup>32</sup> Which leads to yet another data anomaly. The one school that is treated as a school district is the Eastern Virginia Medical College (Census, Individual State Descriptions, 2012), which leads the Census of Governments (2013) to show a cross subsidy of current charges from the classification of higher education to school districts.

<sup>33</sup> Netzer (1972) and Fisher (1993) reach a similar conclusion.

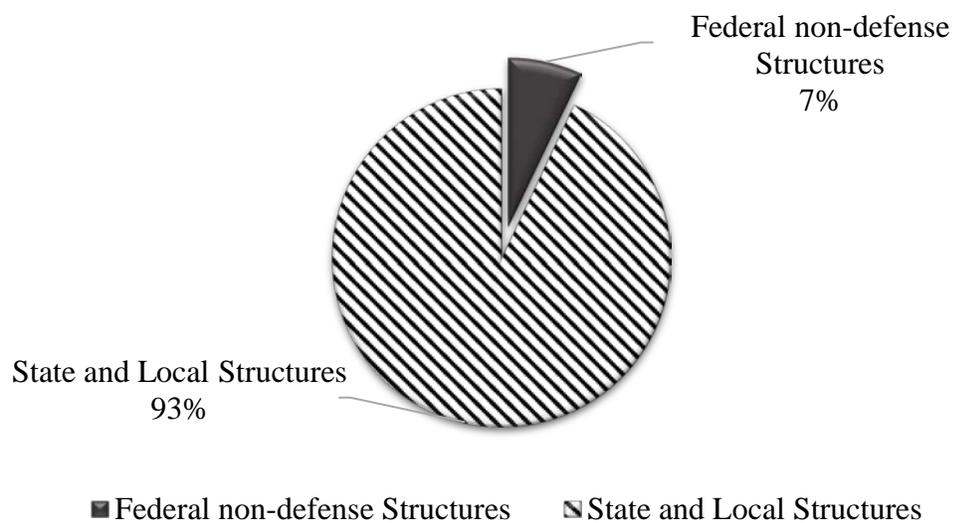
<sup>34</sup> Fisher (2016) recognizes this increasing trend to for a share of higher education to be covered by tuition (user charges), but argues that the decision to turn to tuition is based on incomplete information.

<sup>35</sup> Klein (2014).

<sup>36</sup> Tennessee was the first state to so innovate. Note that “free” colleges refer to zero tuition, but that the student must still pay for related college costs ranging from selected fees to that of room, board, and books.

## Tables and Charts

Chart 1: Fixed Assets Owned: Federal and State& Local Governments, 2015



Source: US Bureau of Economic Analysis, author calculations.

### Box 1. Definitions of Types (Modes) of Infrastructure

Description	Definitions
Education (K-12 as well as post-secondary/higher education)	Schools, colleges, and other educational institutions (e.g., for blind, deaf, and other handicapped individuals), and educational programs for adults, veterans, and other special classes. State institutions of higher education include activities of institutions operated by the state, except that agricultural extension services and experiment stations are classified under Natural Resources. Hospitals serving the public are classified under Hospitals. Revenue and expenditure for dormitories, cafeterias, athletic events, bookstores, and other auxiliary enterprises financed mainly through charges for services are reported on a gross basis.
Hospitals	Funding, construction acquisition, maintenance, or operation of hospital facilities, provision of hospital care, and support of public or private hospitals. Own hospitals are facilities administered directly by the government concerned. Other hospitals refer to support for hospital services in private hospitals or other governments. Nursing homes are included under Public Welfare unless they are directly associated with a government hospital.
Highways	Construction, maintenance, and operation of highways, streets, and related structures, including toll highways, bridges, tunnels, ferries, street lighting, and snow and ice removal. Highway policing and traffic control are classed under Police Protection.
Air Transportation (Airports)	Construction, maintenance, operation, and support of airport facilities.
Parking Facilities	Construction, purchase, maintenance, and operation of public-use parking lots, garages, parking meters, and other distinctive parking facilities on a commercial basis.
Sea and Inland Port Facilities	Canal tolls, rents from leases, concession rents, and other charges for use of commercial or industrial water transport and port terminal facilities and related services. <i>Excludes</i> fees and rents related to water facilities provided for recreational purposes, such as marinas, public docks, and toll ferries.
Natural Resources	Conservation, promotion, and development of natural resources, such as soil, water, forests, minerals, and wildlife. Includes irrigation, drainage, flood control, forestry and fire protection, soil reclamation, soil and water conservation, fish and game programs, agricultural fairs and agricultural extension services and experiment stations.
Parks and Recreation	Provision and support of recreational and cultural scientific facilities and activities including golf courses, play fields, playgrounds, public beaches, swimming pools, tennis courts, parks, auditoriums, stadiums, auto camps, recreation piers, marinas, botanical gardens, galleries, museums, and zoos. Also includes convention centers and exhibition halls.

**Box 1. Continued**

<b>Description</b>	<b>Definitions</b>
Housing and Community Development	Construction and operation of housing and redevelopment projects, and other activities to promote or aid housing and community development.
Sewerage	Provision of sanitary and storm sewers, sewage disposal facilities and services. Sewer services may be provided by a single locality or through intergovernmental coordination. In some parts of the (typically rural) US sewerage is disposed of using private septic tank systems.
Solid Waste Management	Street cleaning, solid waste collection and disposal, and provision of sanitary landfills.
Other Charges	Charges not covered by any of the above categories, such as those derived from court and recording fees, police, fire, correction, defense, public welfare, public nursing homes, public libraries, and health activities. <i>Excludes</i> Reimbursements and special assessments for capital outlay improvements which benefit specific property owners (e.g., Special Assessments) and sale of used vehicles, surplus equipment, scrap materials that do not relate to any specific function or service.

Sources: Census Bureau *Classification Manual* (2006) and *Census of Government Definitions* [www.census.gov](http://www.census.gov).

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## Box 2. Illustration of User Fees and Charges Used by State and Local Governments

Type of Public Infrastructure Services	Description
Education, K–12	School lunch sales, student activity fees, student transportation, sale or rental of books, gymnasium uniforms and equipment use, tuition, sale or rental of text books, revenues from athletic contests. <i>Excludes</i> tuition received from other governments.
Higher Education	Tuition, general student activity fees, transportation fees, dormitory room and board. Also, gross receipts from sales and charges by cafeterias, athletic contests, bookstores, and similarly commercial activities financed wholly or largely through charges. (Census, 2006, Code A16).
Highways and Roads (includes ferries)	This category includes Road, tunnel, and bridge tolls which may vary (i) for the same facility whether the toll is paid by transponder or at a toll gate, (ii) by type of motor vehicle, and (ii) according to where on the highway system it is paid (e.g. in the US East Coast 14 states share the same user-transponder, EZ Pass, is associated with the user’s credit card so that each state records each separate use of the transponder thereby allowing each state to set its own prices the toll amount; many other states and highway authorities have similar own-systems). This category also includes non-utility governmentally owned and operated subway and bus fare receipts as well as landing and departure fees, congestion levies (e.g., High Occupancy Toll lanes that may vary by peak /non- peak times), fees for street cuts and special traffic signs, snow plowing, concession fees to commercial activities (e.g., service stations, restaurants), rights- of- way fees for public utilities, and lease of toll roads. Note: Although US highways are funded in part from the Federal Highway Trust Fund, which is fully tax financed (CBO, May 6, 2014, Table 1), there are no federally owned non- defense highways in the US. In 2012 US Highway Trust Fund grants to state plus local governments were \$66.8 bn, which was equal to 30.2% of total direct spending for highway finance. For the 50 States and DC, road and crossing tolls accounted for 18.9% of total state highway user fees. The other 82.1% was derived from motor fuel and motor carrier taxes. (US Department of Transportation, <i>Highway Statistics, 2014</i> . Mass transit systems that are defined as utilities (see text).

## Box 2. Continued

Type of Public Infrastructure Services	Description
Public Hospitals	<p>Many states require that public hospitals publish their list of fees. Includes charges and fees from patients, private insurance companies, and public insurance programs (such as Medicare for whereby one is automatically enrolled at age 65 if already receiving Social Security or Railroad Retirement Board benefits), and institutions for the handicapped. Charges include services for a special aides, such as a special nursing aide, emergency room fees, operating rooms and patient rooms that vary by (i) the technical nature of the operating room, or (ii) the degree of privacy, whether in a special service such as rehabilitation, intensive care, psychiatric, pulmonary, recovery for room charges. Other direct charges are assessed for anesthetics, lab tests, routine medical supplies from band aids to breathing tubes, charges by type of post- operative therapy (e.g., occupational, physical, pulmonary), body scans (e.g., varying by extent, class/level type), and by location on body of heart scan, CT scan, radiology. Hospitals may also pay a <i>Hospital Provider Fee</i> to help finance the state's role in providing Medicaid (a national health insurance fund) and to defray administrative costs of a Department of Health. <i>Excludes</i> charges of public university hospitals open to general public, revenues received from other governments for care of patients, medical care provided as part of public welfare programs, fees of state schools for the blind, deaf, or handicapped, and health clinics operating on an outpatient basis only.</p>
Air Transportation (airports)	<p>Charges include the aircraft landing fees and, take-off/departure fees may depend on type and weight of aircraft. Aircraft charges may also be assessed for de- icing and snow removal. There are also charges for terminal-area air navigation, aircraft parking slots, en-route air navigation, approach and airport control; airport-noise (often depends on time of day and/or aircraft noise), passenger service in terminals, baggage and cargo service including special security to monitor the activity; hangar spaced and ground (ramp and traffic) management. Passengers pay motor-vehicle parking facility charges, and taxi services special airport user access feed. Charges in this category also include airport-space provided concessions (food courts, gift shops and the like). Note: Other than one regional airport in Missouri (Branson), all major commercial airports in the United States are public and managed by a state local, or regional state/local special district authority. There are no federal commercial airports.</p>
Parking Facilities	<p>Parking fee/garages (typically peak load pricing) and on-street parking (may also have peak load pricing now that in some urban areas one pays by credit card) loading zone; taxi and commercial ride sharing zones.</p>

## Box 2. Continued

<b>Type of Public Infrastructure Services</b>	<b>Description</b>
Sea and Inland Port Facilities	Canal tolls, rents from leases, concession rents, use of port terminal facilities (wharfage, harbor fees), and cargo facility charges on containers may be based on size (length) or tonnage for bulk of heavy-lift cargo. Cargo charges and fees may vary by type distance of cargo shipped type of cargo [e.g., the Port of Honolulu has different fees for inter-island trans-shipment (at the low end) vs. overseas and domestic foreign cargo; plus fees vary by type of cargo (explosives carry a higher fee than dry bulk cargo, animals, and produce)]. Inland fees (both state and local) include dockage and mooring fees, and may for some states be administered in part by a state Department of Natural Resources that are typically fee-for-permit related, e.g., charges for dredging as well as land infill, mooring/boat lifts, permits for culverts, bulk heading, and piers. The state/local charge policy is coordinated with US Customs. The waterways are jointly administered by the US Army Corps of Engineers and the state and/or local government (or a joint interstate state/local authority) depending on in which the waterway is located.
Natural Resources	Sale of minerals and other natural products (other than forestry) from public land, laboratory fees (animal testing), permits to remove or add infill to a water way.
Parks and Recreation	Vehicle entrance fees, hiking fees, camping site fees, recreation facility rental fees, greens fees, parking charges, concession rentals, stadium gate tickets, shelter rentals, emergency safety rescue, beach leases, nature tours, access to zoos.
Housing and Community Development	Gross rentals, tenant charges and other revenue from operation of public housing, inspection for structural building and renovation/repair, equipment installation charges for access to facilities operated by a state or local government (from zoos to baseball stadiums and convention centers to community centers) and concession fees associated with these facilities. Excludes receipts from the sale of property and payments- <i>in-lieu</i> of taxes from housing projects operated by other governments, whether independent housing authorities (special districts) or dependent housing agencies of general purpose governments. Further note that the typical “affordable housing” facility is privately owned and operated.

**Box 2. Continued**

<b>Type of Public Infrastructure Services</b>	<b>Description</b>
Sewerage	Current fees, such as a flat rates benefits charges and flat or variable usage charge e.g., in Maryland a Chesapeake Bay restoration fee as part of the quarterly sewer bill. Some communities also attach to the sewer bill an impervious area charge (e.g., “storm water fee”) based on GPS estimated surfaces such as rooftops, paved driveways, patios, parking lots and other covered areas (regardless of materials used) that are contributors to rainwater runoff entering a sewer system and/or a nearby waterway. Estimated by GPS technology, the fee can be calculated as a statistical median of the amount of impervious area. Because charges are based on square foot area, owners of large office buildings, shopping centers, and parking lots will be charged more than the owners of modest residential buildings (www.dcwater.com).
Solid Waste Management	Fees and charges for garbage collection and disposal, operation of landfills, selling of recyclable materials, operation of landfills, clean- up of hazardous materials, bulk trash pickup. Excludes fees related to regulation or inspection activities, pay-as-you-use-and-throw bags, bulk trash pick-up. One creative way some localities charge for residential solid waste refuse collection is to require that all refuse be deposited in specific bags solid only by the local government. Such bags usually delineated by colors and/or insignia (Fisher, 2016)
Other Charges	Charges not included in the above classifications. Examples include court and recording fees, ambulance services fees, alarm permits, fire response charges, library fees, zoning approval process, loading zone permits, processing service fees for access to various general government services, emergency safety rescue (e.g., boating, hiking). <i>Excludes</i> reimbursements and special assessments for capital outlays that benefit specific property owners.

Sources: Census Bureau *Classification Manual* (2006) and *Census of Government Definitions* (current). [www.census.gov](http://www.census.gov); Fisher (2016); The College Board (2016); US Department of Transportation (2014); Sjoquist (2012; 2016); various state and local government [www.searchers/userchargemanuals](http://www.searchers/userchargemanuals).

**Table 1. State and Local Current Charges as Component of General Revenues, Selected Years**

Type of Revenue	2013		2002		1993	
	\$ m	% of General Revenue	\$ m	% of General Revenue	\$ m	% of General Revenue
<b>General Revenue</b>	2,690,427	100.00%	1,684,879	100.00%	1,041,567	100.00%
<i>Intergovernmental from Federal</i>	584,652	21.73%	360,546	21.40%	198,591	19.07%
<i>General Own Source Revenue</i>	2,105,775	78.27%	1,324,333	78.60%	842,977	80.93%
<i>Taxes</i>	1,455,499	54.10%	905,101	53.72%	594,300	57.06%
Property	455,442	16.93%	279,191	16.57%	189,743	18.22%
Sales & Gross Receipts	496,439	18.45%	324,123	19.24%	209,649	20.13%
General Sales	327,066	12.16%	222,987	13.23%	138,822	13.33%
Selective Sales	169,373	6.30%	101,136	6.00%	70,827	6.80%
Individual Income Tax	338,471	12.58%	202,832	12.04%	123,235	11.83%
Corporate Income Tax	53,039	1.97%	28,152	1.67%	26,417	2.54%
Motor Vehicle License	25,080	0.93%	16,935	1.01%	12,402	1.19%
Other Taxes	87,027	3.23%	34,087	2.02%	32,853	3.15%
<i>Charges and Miscell. Revenue</i>	650,276	24.17%	419,232	24.88%	248,677	23.88%
Current Charges	444,153	16.51%	253,189	15.03%	149,348	14.34%
Education	117,647	4.37%	72,291	4.29%	41,926	4.03%
Hospitals	129,820	4.83%	65,404	3.88%	41,140	3.95%
Highways	15,171	0.56%	8,196	0.49%	4,929	0.47%
Air Transport (Airports)	20,596	0.77%	12,331	0.73%	6,648	0.64%
Parking Facilities	2,734	0.10%	1,402	0.08%	1,002	0.10%
Sea & Inland Port Facilities	4,605	0.17%	2,685	0.16%	1,739	0.17%
Natural Resources	4,842	0.18%	3,001	0.18%	2,148	0.21%
Parks and Recreation	9,916	0.37%	7,021	0.42%	4,151	0.40%
Housing & Community Devl.	6,195	0.23%	4,296	0.25%	3,354	0.32%
Sewerage	50,689	1.88%	27,112	1.61%	15,998	1.54%
Solid Waste Management	16,843	0.63%	11,192	0.66%	7,303	0.70%
Other Charges	65,094	2.42%	38,258	2.27%	19,008	1.82%
Miscellaneous General Revenue	206,124	7.66%	166,043	9.85%	99,329	9.54%
Interest Earnings	50,837	1.89%	67,161	3.99%	50,806	4.88%
Special Assessments	7,154	0.27%	4,779	0.28%	2,664	0.26%
Sale of Property	3,685	0.14%	2,187	0.13%	842	0.08%
Other General Revenue	144,447	5.37%	91,916	5.46%	45,017	4.32%
Exhibit: Utility Revenue*	157,747		102,352		61,602	
Exhibit: Liquor Store Revenue*	8,903		5,065		3,641	
Exhibit: Insurance Trust Revenue*	562,791		14,295		163,937	

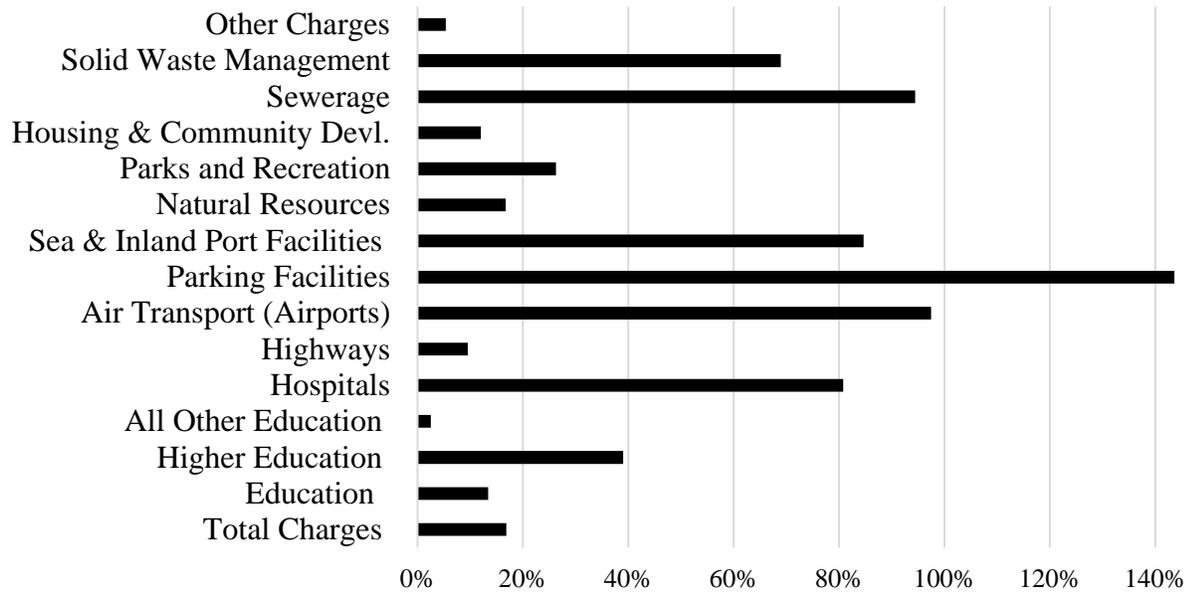
Source: U.S. Census Bureau, 2013 *Census of Governments: Finance, State and Local Government Finances*, selected years. Note: The Census data exclude utility, liquor store, and insurance trust from General Revenues. The basis for distinction is not the fund or administrative unit receiving the revenues, but rather the governance of the agency that collects and manages the revenue sources. See text for further discussion of utilities. Seventeen states and jurisdictions have adopted some form of “control” system for the sale of alcoholic beverages. Thirteen jurisdictions (it may be a state or local unit) sell alcoholic beverages at retail either directly or through an agent. These numbers are presented above just to give perspective to the size of these revenues *vis-a-vis* current charges. Note that the \$ amounts of CC far exceed that of utility revenue and special assessments.

**Table 2. US State & Local Current Charges by Type of Infrastructure, 2013 Thousands US\$, Share of Revenues and Relative to Current Spending**

Item	\$ thousands	% of Total Current Charges	% of Total General Revenues	% Own Source Revenue	% of Current Expenditure
<i>Total Charges</i>	444,152,589	100.00%	16.51%	21.09%	16.83%
Education	117,647,102	26.49%	4.37%	5.59%	13.42%
Higher Education	101,945,211	22.95%	3.79%	4.84%	39.04%
All Other Education	15,701,891	3.54%	0.58%	0.75%	2.55%
Hospitals	129,820,391	29.23%	4.83%	6.16%	80.75%
Highways	15,171,179	3.42%	0.56%	0.72%	9.56%
Air Transport (Airports)	20,595,949	4.64%	0.77%	0.98%	97.43%
Parking Facilities	2,733,953	0.62%	0.10%	0.13%	143.61%
Sea & Inland Port Facilities	4,604,812	1.04%	0.17%	0.22%	84.64%
Natural Resources	4,841,537	1.09%	0.18%	0.23%	16.73%
Parks and Recreation	9,916,241	2.23%	0.37%	0.47%	26.26%
Housing & Community Devl.	6,195,146	1.39%	0.23%	0.29%	12.02%
Sewerage	50,689,306	11.41%	1.88%	2.41%	94.44%
Solid Waste Management	16,842,617	3.79%	0.63%	0.80%	68.90%
Other Charges	65,094,356	14.66%	2.42%	3.09%	5.34%

Source: Barnett, Sheckells, Peterson, Tydings (2014). US Census Bureau (2014).

**Chart 2. 2013 US State & Local Current Charges by Type of Infrastructure as Percentage of Current Expenditure**



Source: Table 2

**Table 3. State and Local Current Charges by Type of Infrastructure Share of Total Revenues by Year, Glance at Trends, and Change of Rank, Selected Years**

Item	1993		2002		2013		Exhibit Nominal \$ Change				Rank in Descending Order 2002-1993	Rank in Descending Order Since 2002
	\$ m	% of Total Charges	\$ m	% of Total Charges	\$ m	% of Total Charges	% Increase, 1993-2002	Index with TCC Set at 100.0	% Increase 2002-2013	Index with TCC Set at 100.0		
<i>Total Charges in \$ Curr.Yr.</i>	149,347	100%	253,189	100%	444,153	100%	197%	1.00	75%	1.00		
Education	41,926	28%	72,290	29%	117,647	26%	181%	0.91	63%	0.83	Sewage	Hospitals
Hospitals	41,140	28%	65,404	26%	129,820	29%	216%	1.09	98%	1.31	Hospitals	Parking
Highways	4,929	3%	8,196	3%	15,171	3%	208%	1.05	85%	1.13	Airports	Sewerage
Air Transport (Airports)	6,648	4%	12,330	5%	20,596	5%	210%	1.06	67%	0.89	Highways	Highways
Parking Facilities	1,002	1%	1,402	1%	2,734	1%	173%	0.88	95%	1.26	Education	Seaports
Sea & Inland Port Facilities	1,739	1%	2,685	1%	4,604	1%	165%	0.83	71%	0.95	Parking	Airports
Natural Resources	2,147	1%	3,001	1%	4,842	1%	126%	0.64	61%	0.81	Seaport	Education
Parks and Recreation	4,151	3%	7,021	3%	9,916	2%	139%	0.70	41%	0.55	Parks and Rec	Nat'l Resource
Housing & Comm. Devl.	3,354	2%	4,296	2%	6,195	1%	85%	0.43	44%	0.59	Solid Waste	Solid Waste
Sewerage	15,998	11%	27,112	11%	50,689	11%	217%	1.10	87%	1.15	Nat'l Resource	Housing & CD
Solid Waste Management	7,303	5%	11,192	4%	16,843	4%	131%	0.66	50%	0.67	Housing & CD	Parks and Rec
Other Charges	19,008	13%	38,258	15%	65,094	15%	242%	1.23	70%	0.93	****	****

Source: Census Bureau, Census of Governments (2014).

**Table 4. State and Local Current Charges as Percent of Spending by Type of Infrastructure Share of Total Charges Revenue, Glance at Trends, and Change in Rank, Select Years**

Item	1993		2002		2013		Change		Rank in Descending Order 2002-1993	Rank in Descending Order Since 2002
	\$ m	CC as % of Exp.	\$ m	CC as % of Exp.	\$ m	CC as % of Exp.	% Increase, 1993-2002	% Increase, 2002-2013		
<i>Total Charges in \$ Current Yr.</i>	149,347	15%	253,189	15%	444,153	17%	69.53%	75.42%		
Education	41,926	12%	72,290	12%	117,647	13%	72.42%	62.74%	Airports	Hospitals
Higher Education	34,955	40%	61,318	39%	101,945	39%	75.42%	66.26%	Education	Parking
All Other Education	6,971	3%	10,972	3%	15,702	3%	57.39%	43.11%	Sewerage	Sewerage
Hospitals	41,140	66%	65,404	75%	129,820	81%	58.98%	98.49%	Parks and Rec	Highways
Highways	4,929	7%	8,196	7%	15,171	10%	66.28%	85.10%	Highways	Seaports
Air Transport (Airports)	6,648	72%	12,330	76%	20,596	97%	85.47%	67.04%	Hospitals	Airports
Parking Facilities	1,002	144%	1,402	125%	2,734	144%	39.92%	95.01%	Seaports	Education
Sea & Inland Port Facilities	1,739	80%	2,685	75%	4,605	85%	54.40%	71.51%	Solid Waste	Nat'l Resource
Natural Resources	2,147	16%	3,001	14%	4,842	17%	39.78%	61.35%	Parking	Solid Waste
Parks and Recreation	4,151	26%	7,021	23%	9,916	26%	69.14%	41.23%	Nat'l Resource	Housing & CD
Housing & Comm. Devl.	3,354	18%	4,296	14%	6,195	12%	28.09%	44.20%	Housing & CD	Parks and Rec
Sewerage	15,998	70%	27,112	87%	50,689	94%	69.47%	86.96%		
Solid Waste Management	7,303	57%	11,192	59%	16,843	69%	53.25%	50.49%		
Other Charges	19,008	4%	38,258	5%	65,094	5%	18.10%	70.14%		

Source: Census Bureau, *Census of Governments* (2014).

**Table 5. State and Local Current Charges by Type of Infrastructure Share of Current Charges by Mode to Total Charges, Millions Real US\$, Selected Years**

Item	1993		2002		2013	
	1993 \$	2013 \$	2002\$	2013 \$	2013\$	2013\$
<i>Total Charges In 2013 \$</i>	149,347	240,449	253,189	326,614	444,153	444,153
Education	41,926	67,501	72,290	93,254	117,647	117,647
Hospitals	41,140	66,235	65,404	84,371	129,820	129,820
Highways	4,929	7,936	8,196	10,573	15,171	15,171
Air Transport (Airports)	6,648	10,703	12,330	15,906	20,596	20,596
Parking Facilities	1,002	1,613	1,402	1,809	2,734	2,734
Sea & Inland Port Facilities	1,739	2,800	2,685	3,464	4,604	4,604
Natural Resources	2,147	3,457	3,001	3,871	4,842	4,842
Parks and Recreation	4,151	6,683	7,021	9,057	9,916	9,916
Housing & Comm. Devl.	3,354	5,400	4,296	5,542	6,195	6,195
Sewerage	15,998	25,757	27,112	34,974	50,689	50,689
Solid Waste Management	7,303	11,758	11,192	14,438	16,843	16,843
Other Charges	19,008	30,603	38,258	49,353	65,094	65,094

Source: Barnett, Sheckells, Peterson, Tydings (2014). Census Bureau, *Census of Governments* (2014).

**Table 6. State and Local Current Charges by Type of Infrastructure Annual Rates of Change, Current and Real Dollars, Selected Time Periods**

Item	1993- 2002	2002- 2013	1993- 2013	1993- 2002	2002- 2013	1993- 2013
	In Current \$			In 2013 \$		
<i>Total Charges</i>	6.04%	5.24	5.60%	3.46%	2.83	3.12%
Education	6.24%	4.53	5.29%	3.66%	2.13	2.82%
Hospitals	5.29%	6.43	5.91%	2.73%	4.00	3.42%
Highways	5.81%	5.76	5.78%	3.24%	3.34	3.29%
Air Transport (Airports)	7.10%	4.77	5.82%	4.50%	2.38	3.33%
Parking Facilities	3.80%	6.26	5.15%	1.28%	3.83	2.67%
Sea & Inland Port Facilities	4.94%	5.02	4.99%	2.39%	2.62	2.52%
Natural Resources	3.79%	4.44	4.15%	1.27%	2.05	1.70%
Parks and Recreation	6.01%	3.19	4.45%	3.44%	0.83	1.99%
Housing & Community Devl.	2.79%	3.38	3.12%	0.29%	1.02	0.69%
Sewerage	6.04%	5.85	5.94%	3.46%	3.43	3.44%
Solid Waste Management	4.86%	3.79	4.27%	2.31%	1.41	1.81%
Other Charges	8.08%	4.95	6.35%	5.45%	2.55	3.85%

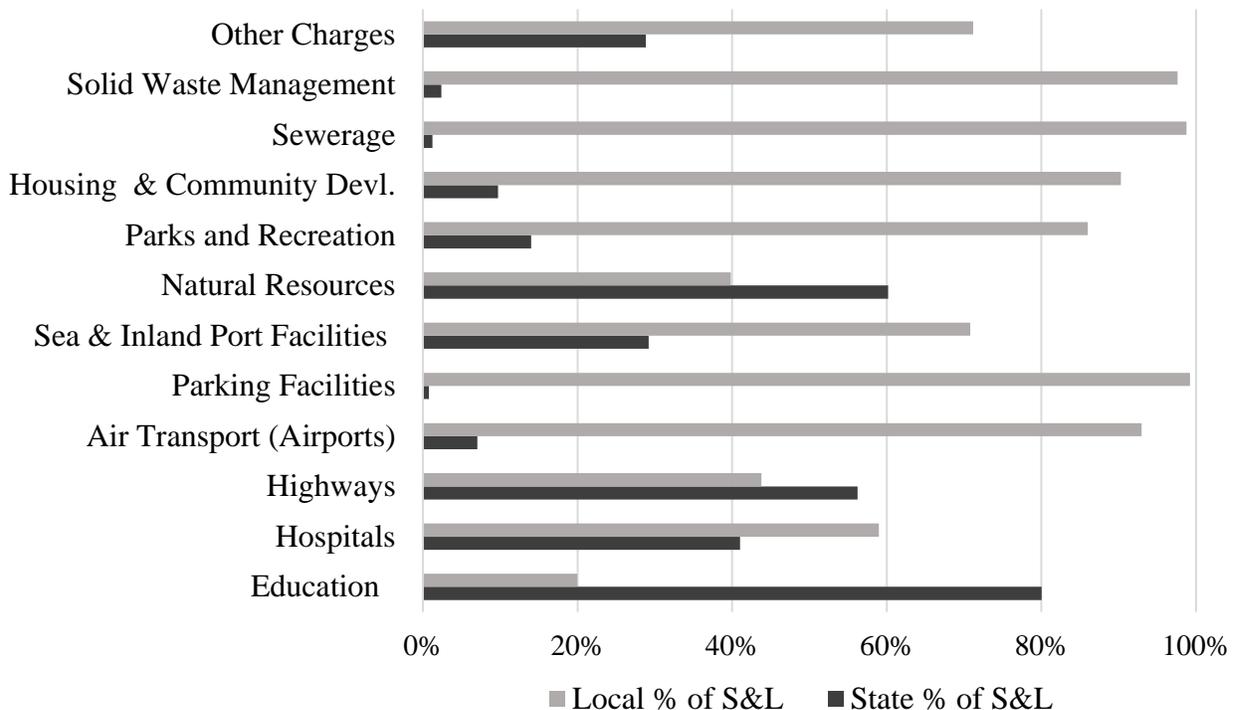
Source: Table 5

**Table 7. Current Charges by Type (State vs. Local) of Government and Mode Percentage Distribution  
2013**

Items	State & Local	State	Local
		% of S&L	% of S&L
<i>Current Charge</i>	100.00%	41.30%	58.70%
Education	100.00%	80.03%	19.97%
Hospitals	100.00%	41.01%	58.99%
Highways	100.00%	56.21%	43.79%
Air Transport (Airports)	100.00%	7.05%	92.95%
Parking Facilities	100.00%	0.80%	99.20%
Sea & Inland Port Facilities	100.00%	29.19%	70.81%
Natural Resources	100.00%	60.19%	39.81%
Parks and Recreation	100.00%	14.01%	85.99%
Housing & Community Devl.	100.00%	9.73%	90.27%
Sewerage	100.00%	1.23%	98.77%
Solid Waste Management	100.00%	2.39%	97.61%
Other Charges	100.00%	28.82%	71.18%

Source: Census Bureau, Government *Finance Statistics*, Author Calculations

**Chart 3. User Charge Across and by Type of Governments, Percentage Distribution**



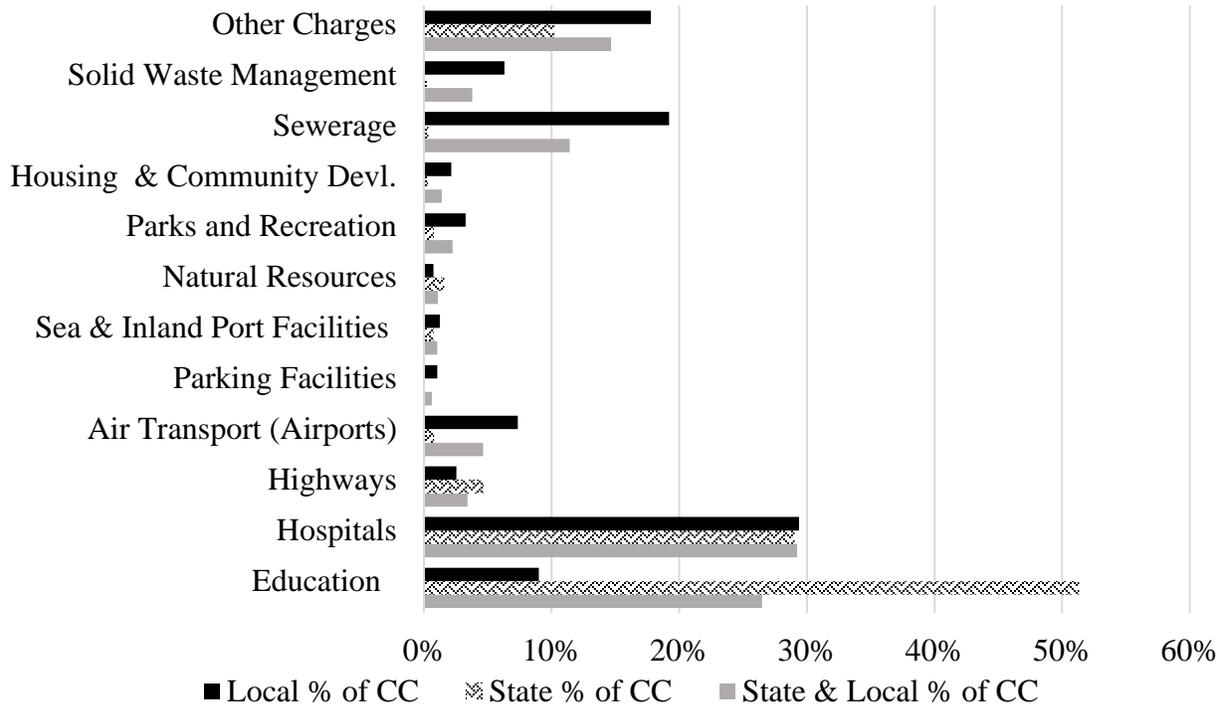
Source: Table 7

**Table 8. Composition of Current Charges Within the State and Local Government Sectors  
Percentage Distribution  
2013**

Items	State & Local % of CC	State % of CC	Local % of CC
<i>Current Charge</i>	100.00%	100.00%	100.00%
Education	26.49%	51.33%	9.01%
Hospitals	29.23%	29.02%	29.37%
Highways	3.42%	4.65%	2.55%
Air Transport (Airports)	4.64%	0.79%	7.34%
Parking Facilities	0.62%	0.01%	1.04%
Sea & Inland Port Facilities	1.04%	0.73%	1.25%
Natural Resources	1.09%	1.59%	0.74%
Parks and Recreation	2.23%	0.76%	3.27%
Housing & Community Development.	1.39%	0.33%	2.15%
Sewerage	11.41%	0.34%	19.20%
Solid Waste Management	3.79%	0.22%	6.31%
Other Charges	14.66%	10.23%	17.77%

Source: Census Bureau, *Government Finance Statistics*, Author Calculations

**Chart 4. Charge by Type of Governments Percentage Distribution**



Source: Table 8

**Table 9. Percentage Share of Local Current Charges by Type of Local Government, Census Region and Division, 2012**

<b>Region and Division</b>	<b>Counties</b>	<b>Municipal</b>	<b>Townships</b>	<b>Special Districts</b>	<b>School Districts</b>
<i>UNITED STATES</i>	26.66%	39.90%	4.22%	20.90 %	8.33 %
New England	3.85%	46.18%	28.94%	15.99%	5.04%
Middle Atlantic	29.06	29.90%	10.11%	22.99%	7.94%
<b>NORTHEAST</b>	12.26	40.75%	22.67%	18.32%	6.01%
East North Central	34.99	36.63%	2.10%	11.99%	14.28%
West North	24.82	43.43%	0.07%	15.99%	15.69%
<b>MIDWEST</b>	29.06	40.59%	0.92%	14.32%	15.10%
South Atlantic	32.00	33.60%	0.00%	30.89%	3.51%
East South Central	38.50	30.95%	0.00%	24.57%	5.99%
West South	28.84	50.20%	0.00%	11.15%	9.81%
<b>SOUTH</b>	32.78	36.88%	0.00%	24.76%	5.57%
Mountain	29.12	38.65%	0.00%	23.94%	8.28%
Pacific	22.04	48.95%	0.00%	23.31%	5.70%
<b>WEST</b>	26.40	42.61%	0.00%	23.70%	7.29%

Source: Census Bureau, *Government Finance Statistics*, Author Calculations

**Table 10. Current Charges as Percentage of General Revenue from Own Source by Region and Regional Division, 2012**

<b>Region and Division</b>	<b>Counties</b>	<b>Municipal</b>	<b>Townships</b>	<b>Special Districts</b>	<b>School Districts</b>
<i>UNITED STATES</i>	30.88%	27.56%	12.53%	63.12%	8.98%
New England	22.45%	23.07%	10.44%	64.50%	30.60%
Middle Atlantic	28.79%	17.52%	17.67%	70.46%	3.90%
<i>NORTHEAST</i>	24.56%	21.22%	12.85%	66.49%	21.70%
East North Central	39.26%	32.82%	12.18%	44.41%	10.92%
West North	30.56%	34.01%	2.90%	59.90%	14.07%
<i>MIDWEST</i>	34.19%	33.52%	6.77%	53.45%	12.76%
South Atlantic	23.37%	29.69%	0.00%	74.27%	10.47%
East South Central	40.07%	36.73%	0.00%	74.12%	16.41%
West South	30.38%	35.32%	0.00%	52.68%	11.98%
<i>SOUTH</i>	28.95%	32.67%	0.00%	69.15%	12.23%
Mountain	28.46%	39.35%	0.00%	55.06%	10.82%
Pacific	26.08%	32.54%	0.00%	48.79%	7.47%
<i>WEST</i>	27.54%	36.73%	0.00%	52.65%	9.53%

Source: Census Bureau, Author Calculations

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**Table 11. Current Charges as Percentage of General Revenue from Own Source by Region, Division, and State, 2012, All States**

<b>States</b>	<b>Counties</b>	<b>Municipal</b>	<b>Townships</b>	<b>Special Districts</b>	<b>School Districts</b>
<i>UNITED STATES</i>	<b>30.88%</b>	<b>27.56%</b>	<b>12.53%</b>	<b>63.12%</b>	<b>8.98%</b>
Connecticut	0.00%	12.11%	7.01%	56.65%	81.63%
Maine	16.07%	27.60%	10.58%	87.85%	3.42%
Massachusetts	45.34%	19.44%	10.40%	78.80%	58.74%
New Hampshire	18.97%	19.92%	11.44%	66.25%	3.06%
Rhode Island	0.00%	17.02%	8.04%	41.49%	2.21%
Vermont	54.31%	42.31%	15.17%	55.96%	34.52%
<b>New England</b>	<b>22.45%</b>	<b>23.07%</b>	<b>10.44%</b>	<b>64.50%</b>	<b>30.60%</b>
New Jersey	31.21%	14.37%	14.98%	70.47%	3.26%
New York	24.82%	14.98%	13.03%	72.94%	2.27%
Pennsylvania	30.32%	23.21%	25.02%	67.98%	6.15%
<b>Middle Atlantic</b>	<b>28.79%</b>	<b>17.52%</b>	<b>17.67%</b>	<b>70.46%</b>	<b>3.90%</b>
<i>NORTHEAST</i>	<b>24.56%</b>	<b>21.22%</b>	<b>12.85%</b>	<b>66.49%</b>	<b>21.70%</b>
Illinois	26.71%	25.97%	6.85%	34.49%	7.22%
Indiana	51.18%	40.10%	5.43%	24.09%	10.65%
Michigan	44.60%	39.84%	27.49%	65.77%	16.64%
Ohio	37.09%	26.87%	6.07%	51.89%	11.22%
Wisconsin	36.73%	31.33%	15.06%	45.82%	8.87%
<b>East North Central</b>	<b>39.26%</b>	<b>32.82%</b>	<b>12.18%</b>	<b>44.41%</b>	<b>10.92%</b>
Iowa	43.32%	41.77%	0.00%	76.85%	15.36%
Kansas	27.40%	29.51%	0.52%	67.06%	17.83%
Minnesota	29.65%	37.72%	4.87%	77.60%	17.06%
Missouri	29.77%	33.61%	4.65%	50.51%	13.53%
Nebraska	48.61%	32.18%	8.41%	55.64%	10.16%
North Dakota	21.63%	28.47%	1.64%	38.34%	11.70%
South Dakota	13.53%	34.84%	0.18%	53.30%	12.85%
<b>West North Central</b>	<b>30.56%</b>	<b>34.01%</b>	<b>2.90%</b>	<b>59.90%</b>	<b>14.07%</b>
<i>MIDWEST</i>	<b>34.19%</b>	<b>33.52%</b>	<b>6.77%</b>	<b>53.45%</b>	<b>12.76%</b>
Delaware	40.44%	27.87%	0.00%	84.23%	2.88%
District of Columbia	0.00%	8.52%	0.00%	0.00%	0.00%
Florida	33.39%	33.78%	0.00%	63.35%	14.81%
Georgia	15.10%	45.17%	0.00%	89.32%	6.55%
Maryland	15.60%	21.60%	0.00%	87.31%	0.00%
North Carolina	31.01%	32.97%	0.00%	87.85%	0.00%
South Carolina	34.09%	27.16%	0.00%	90.45%	7.54%
Virginia	11.87%	19.01%	0.00%	88.03%	60.00%
West Virginia	28.85%	51.15%	0.00%	77.85%	2.49%
<b>South Atlantic</b>	<b>23.37%</b>	<b>29.69%</b>	<b>0.00%</b>	<b>74.27%</b>	<b>10.47%</b>

Table 11. Continued

States	Counties	Municipal	Townships	Special Districts	School Districts
Alabama	24.72%	17.59%	0.00%	91.94%	19.00%
Kentucky	39.20%	36.20%	0.00%	53.19%	5.40%
Mississippi	60.09%	60.85%	0.00%	69.44%	23.14%
Tennessee	36.26%	32.29%	0.00%	81.91%	18.11%
<b>East South Central</b>	<b>40.07%</b>	<b>36.73%</b>	<b>0.00%</b>	<b>74.12%</b>	<b>16.41%</b>
Arkansas	15.97%	38.61%	0.00%	45.50%	23.23%
Louisiana	40.13%	30.74%	0.00%	65.42%	2.15%
Oklahoma	34.82%	39.77%	0.00%	54.78%	14.59%
Texas	30.59%	32.18%	0.00%	45.03%	7.96%
<b>West South Central</b>	<b>30.38%</b>	<b>35.32%</b>	<b>0.00%</b>	<b>52.68%</b>	<b>11.98%</b>
<i>SOUTH</i>	<b>28.95%</b>	<b>32.67%</b>	<b>0.00%</b>	<b>69.15%</b>	<b>12.23%</b>
Arizona	16.92%	34.94%	0.00%	56.53%	10.38%
Colorado	18.87%	37.60%	0.00%	45.84%	11.25%
Idaho	36.44%	42.70%	0.00%	64.11%	14.64%
Montana	24.98%	38.21%	0.00%	56.24%	14.70%
Nevada	41.16%	38.63%	0.00%	56.19%	3.57%
New Mexico	15.76%	33.73%	0.00%	46.64%	13.49%
Utah	29.34%	33.58%	0.00%	39.03%	5.19%
Wyoming	44.19%	55.40%	0.00%	75.91%	13.32%
<b>Mountain</b>	<b>28.46%</b>	<b>39.35%</b>	<b>0.00%</b>	<b>55.06%</b>	<b>10.82%</b>
Alaska	23.20%	34.52%	0.00%	70.89%	0.00%
California	40.40%	31.86%	0.00%	59.72%	8.96%
Hawaii	16.08%	27.96%	0.00%	4.51%	0.00%
Oregon	25.01%	33.76%	0.00%	49.74%	19.08%
Washington	25.70%	34.60%	0.00%	59.11%	9.33%
<b>Pacific</b>	<b>26.08%</b>	<b>32.54%</b>	<b>0.00%</b>	<b>48.79%</b>	<b>7.47%</b>
<i>WEST</i>	<b>27.54%</b>	<b>36.73%</b>	<b>0.00%</b>	<b>52.65%</b>	<b>9.53%</b>
<b>Unweighted Average</b>	<b>29.05%</b>	<b>31.88%</b>	<b>3.86%</b>	<b>60.78%</b>	<b>13.34%</b>

Source: Census Bureau, Author Calculations

**Table 12. Rank Correlation Results**

	# of States	Rank Correlation*	t	Significant Level %
Per Capita Income				
All States	51	-0.5943	-5.1727	99
All States other than Non-income Tax States	43	-0.6226	-5.0947	99
All States other than Non-sales Tax States	46	-0.5631	-4.5201	99
All States Education & Hospitals Excluded	51	-0.1757	-3.6129	not significant
All States other than Non-income tax and Non-sales Tax	40	-0.6311	-5.0159	99
All States CC as % of Direct Current Spending	51	-0.4586	-3.6129	99
Revenue Capacity, CC as % of Own Source Revenue	51	-0.6248	-5.6015	99
Revenue Effort, CC as % of Own Source Revenue	51	-0.0711	-0.4992	not significant

Source: Bureau of Economic Analysis, Author Calculations

## Appendices

**Table A1. Broad Definition of State and Local Charges 2013**

Item	\$ m	% of Total Items	% GR	% OSR
Current Charges	444,153	85.78%	16.51%	21.09%
Motor Fuel Taxes	41,401	8.00%	1.54%	1.97%
Motor Vehicle License Taxes	25,080	4.84%	0.93%	1.19%
Special Assessments	7,154	1.38%	0.27%	0.34%
Total	517,788	100.00%	19.25%	24.59%

Source: Census Bureau, 2013

**Table A2. Detail Current Charges by Type of Government (State vs. Local) and Infrastructure Mode, Selected Years**

Item	State & Local		State		Local	
	\$ 000	Total S&L	\$ 000	% State Share	\$ 000	% Local Share
<b>1993</b>						
Current Charge	149,347,957	100%	57,383,789	38.42%	91,964,168	61.58%
Education	41,926,373	100%	31,269,701	74.58%	10,656,672	25.42%
Hospitals	41,140,272	100%	13,953,184	33.92%	27,187,088	66.08%
Highways	4,929,342	100%	3,061,204	62.10%	1,868,138	37.90%
Air Transport (Airports)	6,648,098	100%	725,824	10.92%	5,922,274	89.08%
Parking Facilities	1,002,055	100%	0	0.00%	1,002,055	100.00%
Sea & Inland Port Facilities	1,738,624	100%	409,263	23.54%	1,329,361	76.46%
Natural Resources	2,147,947	100%	1,531,650	71.31%	616,297	28.69%
Parks and Recreation	4,151,469	100%	867,181	20.89%	3,284,288	79.11%
Housing & Community Devl.	3,354,307	100%	254,267	7.58%	3,100,040	92.42%
Sewerage	15,998,302	100%	28,475	0.18%	15,969,827	99.82%
Solid Waste Management	7,303,352	100%	318,065	4.36%	6,985,287	95.64%
Other Charges	19,007,821	100%	4,964,975	26.12%	14,042,846	73.88%
<b>2002</b>						
Current Charge	253,189,078	100.00%	100,213,156	39.58%	152,975,922	60.42%
Education	72,290,510	100.00%	55,056,005	76.16%	17,234,505	23.84%
Hospitals	65,404,087	100.00%	24,352,132	37.23%	41,051,955	62.77%
Highways	8,196,456	100.00%	5,088,978	62.09%	3,107,478	37.91%
Air Transport (Airports)	12,330,615	100.00%	791,614	6.42%	11,539,001	93.58%
Parking Facilities	1,402,243	100.00%	0	0.00%	1,402,243	100.00%
Sea & Inland Port Facilities	2,685,135	100.00%	735,873	27.41%	1,949,262	72.59%
Natural Resources	3,001,013	100.00%	2,115,202	70.48%	885,811	29.52%
Parks and Recreation	7,021,178	100.00%	1,199,448	17.08%	5,821,730	82.92%
Housing & Community Devl.	4,295,737	100.00%	529,252	12.32%	3,766,485	87.68%
Sewerage	27,112,453	100.00%	33,643	0.12%	27,078,810	99.88%
Solid Waste Management	11,192,000	100.00%	369,854	3.30%	10,822,146	96.70%
Other Charges	38,257,651	100.00%	9,941,155	25.98%	28,316,496	74.02%
<b>2013</b>						
Current Charge	444,152,589	100.00%	183,433,664	41.30%	260,718,925	58.70%
Education	117,647,102	100.00%	94,158,447	80.03%	23,488,655	19.97%
Hospitals	129,820,391	100.00%	53,241,123	41.01%	76,579,268	58.99%
Highways	15,171,179	100.00%	8,527,369	56.21%	6,643,810	43.79%
Air Transport (Airports)	20,595,949	100.00%	1,451,406	7.05%	19,144,543	92.95%
Parking Facilities	2,733,953	100.00%	21,748	0.80%	2,712,205	99.20%
Sea & Inland Port Facilities	4,604,812	100.00%	1,344,250	29.19%	3,260,562	70.81%
Natural Resources	4,841,537	100.00%	2,914,201	60.19%	1,927,336	39.81%
Parks and Recreation	9,916,241	100.00%	1,389,680	14.01%	8,526,561	85.99%
Housing & Community Devl.	6,195,146	100.00%	602,630	9.73%	5,592,516	90.27%
Sewerage	50,689,306	100.00%	621,920	1.23%	50,067,386	98.77%
Solid Waste Management	16,842,617	100.00%	401,840	2.39%	16,440,777	97.61%
Other Charges	65,094,356	100.00%	18,759,050	28.82%	46,335,306	71.18%

Source: Census Bureau, Government Finances, Author Calculations

**Table A3. Detail of Current Charges within Type of Government by Mode in Dollars and Percentages, Selected Years**

Item	1993		2002		2013	
	\$ 000	% of CC	\$ 000	% of CC	\$ 000	% of CC
<b>State &amp; Local</b>						
Current Charge	149,347,957	100.00%	253,189,078	100.00%	444,152,589	100.00%
Education	41,926,373	28.07%	72,290,510	28.55%	117,647,102	26.49%
Hospitals	41,140,272	27.55%	65,404,087	25.83%	129,820,391	29.23%
Highways	4,929,342	3.30%	8,196,456	3.24%	15,171,179	3.42%
Air Transport (Airports)	6,648,098	4.45%	12,330,615	4.87%	20,595,949	4.64%
Parking Facilities	1,002,055	0.67%	1,402,243	0.55%	2,733,953	0.62%
Sea & Inland Port Facilities	1,738,624	1.16%	2,685,135	1.06%	4,604,812	1.04%
Natural Resources	2,147,947	1.44%	3,001,013	1.19%	4,841,537	1.09%
Parks and Recreation	4,151,469	2.78%	7,021,178	2.77%	9,916,241	2.23%
Housing & Community Devl.	3,354,307	2.25%	4,295,737	1.70%	6,195,146	1.39%
Sewerage	15,998,302	10.71%	27,112,453	10.71%	50,689,306	11.41%
Solid Waste Management	7,303,352	4.89%	11,192,000	4.42%	16,842,617	3.79%
Other Charges	19,007,821	12.73%	38,257,651	15.11%	65,094,356	14.66%
<b>State Only</b>						
Current Charge	57,383,789	100.00%	100,213,156	100.00%	183,433,664	100.00%
Education	31,269,701	54.49%	55,056,005	54.94%	94,158,447	51.33%
Hospitals	13,953,184	24.32%	24,352,132	24.30%	53,241,123	29.02%
Highways	3,061,204	5.33%	5,088,978	5.08%	8,527,369	4.65%
Air Transport (Airports)	725,824	1.26%	791,614	0.79%	1,451,406	0.79%
Parking Facilities	0	0.00%	0	0.00%	21,748	0.01%
Sea & Inland Port Facilities	409,263	0.71%	735,873	0.73%	1,344,250	0.73%
Natural Resources	1,531,650	2.67%	2,115,202	2.11%	2,914,201	1.59%
Parks and Recreation	867,181	1.51%	1,199,448	1.20%	1,389,680	0.76%
Housing & Community Devl.	254,267	0.44%	529,252	0.53%	602,630	0.33%
Sewerage	28,475	0.05%	33,643	0.03%	621,920	0.34%
Solid Waste Management	318,065	0.55%	369,854	0.37%	401,840	0.22%
Other Charges	4,964,975	8.65%	9,941,155	9.92%	18,759,050	10.23%
<b>Local Only</b>						
Current Charge	91,964,168	100.00%	152,975,922	100.00%	260,718,925	100.00%
Education	10,656,672	11.59%	17,234,505	11.27%	23,488,655	9.01%
Hospitals	27,187,088	29.56%	41,051,955	26.84%	76,579,268	29.37%
Highways	1,868,138	2.03%	3,107,478	2.03%	6,643,810	2.55%
Air Transport (Airports)	5,922,274	6.44%	11,539,001	7.54%	19,144,543	7.34%
Parking Facilities	1,002,055	1.09%	1,402,243	0.92%	2,712,205	1.04%
Sea & Inland Port Facilities	1,329,361	1.45%	1,949,262	1.27%	3,260,562	1.25%
Natural Resources	616,297	0.67%	885,811	0.58%	1,927,336	0.74%
Parks and Recreation	3,284,288	3.57%	5,821,730	3.81%	8,526,561	3.27%
Housing & Community Devl.	3,100,040	3.37%	3,766,485	2.46%	5,592,516	2.15%
Sewerage	15,969,827	17.37%	27,078,810	17.70%	50,067,386	19.20%
Solid Waste Management	6,985,287	7.60%	10,822,146	7.07%	16,440,777	6.31%
Other Charges	14,042,846	15.27%	28,316,496	18.51%	46,335,306	17.77%

Source: Census Bureau, Government Finance Statistics, Author Calculation

**Table A4. Percent of Current Charges Relative to Own Source Revenue Per Capita Income, Revenue Capacity Ranks, All States**

State	CC as % of Own Source Revenue		Per Capita Income		Revenue Capacity	
	%	Rank	\$	Rank	\$	Rank
Alabama	34.52%	2	36,176	45	5,229	49
Alaska	11.87%	49	51,259	9	9,567	4
Arizona	21.61%	26	36,723	42	5,344	46
Arkansas	21.04%	29	36,529	44	5,259	48
California	21.91%	24	48,125	12	7,007	18
Colorado	25.30%	12	46,746	15	6,930	21
Connecticut	9.54%	50	62,112	2	8,694	5
Delaware	20.82%	31	44,819	21	7,731	8
District of Columbia	8.24%	51	68,606	1	11,404	1
Florida	26.85%	9	41,309	29	5,854	34
Georgia	23.88%	18	37,596	41	5,437	44
Hawaii	20.33%	33	44,314	23	7,427	14
Idaho	24.45%	14	35,641	47	5,287	47
Illinois	14.13%	46	46,477	16	6,685	24
Indiana	24.68%	13	38,291	39	5,624	38
Iowa	28.71%	4	43,735	26	6,990	20
Kansas	26.03%	10	44,311	24	6,332	27
Kentucky	22.12%	22	35,967	46	5,353	45
Louisiana	24.42%	15	40,819	30	5,922	32
Maine	15.59%	42	39,562	33	6,366	26
Maryland	15.69%	41	52,545	7	7,625	10
Massachusetts	15.18%	43	56,549	3	8,472	6
Michigan	25.70%	11	39,197	37	5,527	41
Minnesota	17.69%	38	47,410	14	7,038	16
Mississippi	31.62%	3	33,629	51	4,776	51
Missouri	22.74%	21	40,297	32	5,916	33
Montana	20.31%	34	38,884	38	6,780	23
Nebraska	22.04%	23	46,254	17	7,078	15
Nevada	21.51%	27	39,223	36	5,767	36
New Hampshire	17.21%	39	50,535	10	7,575	11
New Jersey	14.69%	45	55,194	4	7,950	7
New Mexico	18.22%	37	35,254	49	5,599	39
New York	13.68%	48	53,606	6	7,659	9
North Carolina	28.49%	5	37,774	40	5,938	31
North Dakota	14.09%	47	54,373	5	10,229	2
Ohio	21.47%	28	40,749	31	5,751	37
Oklahoma	23.10%	20	41,962	28	5,847	35
Oregon	27.17%	7	39,426	34	6,131	29
Pennsylvania	20.87%	30	46,028	19	6,442	25
Rhode Island	15.12%	44	46,145	18	6,866	22
South Carolina	35.11%	1	35,472	48	5,218	50
South Dakota	18.36%	36	44,772	22	7,495	12
Tennessee	24.12%	17	39,312	35	5,571	40
Texas	20.55%	32	43,807	25	6,213	28
Utah	28.20%	6	36,542	43	5,506	42
Vermont	16.33%	40	44,839	20	7,008	17
Virginia	24.22%	16	48,956	11	7,467	13
Washington	26.98%	8	47,468	13	6,994	19
West Virginia	21.81%	25	35,163	50	5,461	43
Wisconsin	19.79%	35	42,737	27	6,121	30
Wyoming	23.74%	19	51,791	8	9,628	3

Source: Bureau of Economic Analysis, Tax Policy Center (2016), Author Calculations

**Table A5. Direct Expenditure Net of Capital Outlay by Mode, 2012 Million US \$**

Description	State & Local	State	Local	County	Municipal	Township	Special District	School District
Direct general expenditure	2,303,051	1,051,358	1,251,694	317,261	337,608	40,046	106,920	449,859
Education	784,596	241,850	542,746	48,631	45,661	11,606	3,769	433,079
Hospitals	146,404	62,216	84,188	35,806	15,676	66	32,640	0
Highways	69,528	30,167	39,361	14,638	16,986	4,568	3,169	0
Air transportation (airports)	20,882	1,892	18,990	3,485	9,449	65	5,991	0
Parking facilities	1,892	10	1,882	79	1,565	37	201	0
Sea and inland port facilities	5,279	1,579	3,700	333	1,258	12	2,097	0
Natural resources	23,517	16,533	6,985	2,818	878	108	3,180	0.44
Parks and recreation	29,148	3,900	25,248	5,070	15,408	1,176	3,594	0
Housing and community devel.	53,659	10,080	43,579	3,924	18,567	346	20,743	0
Sewerage	31,102	585	30,517	4,327	18,176	1,605	6,409	0
Solid waste management	22,379	2,263	20,117	5,462	11,764	1,515	1,375	0
All other functions	1,114,665	680,284	434,381	192,688	182,222	18,941	23,751	16,779

Source: Census Bureaus (2012), Author calculations

**Table A6. Direct Expenditure Including Capital Outlay, Infrastructure by Mode, 2012 Million US \$**

Description	State & Local	State	Local	County	Municipal	Township	Special District	School District
Direct general expenditure	2,589,022	1,166,312	1,422,710	350,364	401,284	45,598	129,452	496,013
Education	869,223	270,501	598,722	53,001	49,951	12,761	3,775	479,233
Hospitals	155,899	65,514	90,384	38,218	16,330	66	35,770	0
Highways	160,327	97,509	62,818	22,185	30,569	5,803	4,261	0
Air transportation (airports)	20,882	1,892	18,990	3,485	9,449	65	5,991	0
Parking facilities	1,892	10	1,882	79	1,565	37	201	0
Sea and inland port facilities	5,279	1,579	3,700	333	1,258	12	2,097	0
Natural resources	28,977	18,835	10,142	3,925	1,512	164	4,541	0.44
Parks and recreation	37,446	4,632	32,815	6,473	20,200	1,549	4,593	0
Housing and community devel.	53,659	10,080	43,579	3,924	18,567	346	20,743	0
Sewerage	51,742	773	50,969	7,174	30,648	2,247	10,899	0
Solid waste management	24,360	2,451	21,909	5,892	12,876	1,574	1,566	0
All other functions	1,179,337	692,537	486,800	205,675	208,358	20,973	35,014	16,779

Source: Census Bureau (2012), Author calculations

## References

Altman, Klein, and Krueger. *Financing U.S. Transportation Infrastructure in the 21<sup>st</sup> Century*, The Hamilton Project Discussion Paper 2015-04. Washington, DC: The Brookings Institution, May 2015.

Basso, Jack and Tyler Duvall. *Proposal 9: Funding Transportation Infrastructure with User Fees*, The Hamilton Project. Washington, DC: The Brookings Institution, February 2013.

Bliss, Laura. *Could Congestion Pricing Finally Work for New York City?* CITYLAB, January 19, 2018. [www.citylab.com/transportation/2018/01/](http://www.citylab.com/transportation/2018/01/)

Bird, Richard M. *Charging for Public Services: A New Look at an Old Idea*. Toronto: Canadian Tax Foundation, 1976.

Bird, Richard M. "Why we should but don't pay the right prices for public infrastructure" in *Financing Infrastructure*, edited by Richard Bird and Enid Slack (Kingston: McGill-Queens University Press, 2017).

Bird, Richard M. and Enid Slack, eds. *Financing Infrastructure*. Kingston: McGill-Queens University Press, 2017.

Bird, Richard M. and Enid Slack. "Financing Urban Infrastructure: Should Users Pay?" *Financing Infrastructure*, edited by Richard M. Bird and Enid Slack, eds. Kingston: McGill-Queens University Press, 2017.

Clark, David Allen. FY 2017 Department of Transportation Funding Streams. Washington, DC: Office of the Chief Financial Officer of the District of Columbia, June 7, 2016.

College Board. *Trends in College Pricing, 2016*. New York: College Board

Commerce Clearing House (CCH), *State Tax Handbook*: Chicago: Wolters Kluwer, 2015

Dannin, Ellen and Lee Cokorinos, "Infrastructure Privatization in the New Millennium," in *The Oxford Handbook and State and Local Government Finance*, edited by Robert D. Ebel and John E. Petersen. Oxford and New York: Oxford University Press, 2012), 427-755.

Downing, Paul B. "User charges, Impact Fees, and Service Charges" in *Handbook on Taxation*, edited by W. Bartley Hildreth and James A. Richardson, New York: Marcel Dekker, 1999, 329-262.

Duggan, Christopher and Sarah E. Claypool. "Minnesota Supreme Court Holds St. Paul Right of Way Charges Are Taxes". *State Tax Notes*, January 23, 2017. 367-369.

Ebel, Robert D, LeAnn Luna, and Matthew N. Murray, "State General Business Taxation One More Time: CIT, VAT or GRT?" *National Tax Journal* (December 2016), 740-761

Ebel, Robert D., John E. Petersen, and Ha T.T. Vu. "The Great Recession: Impacts and Outlook for US State and Local Finance." *Municipal Research Journal* (Spring /Summer 2013), 33-77.

Edelman, Peter. *Not A Crime To Be Poor*. New York: The New Press. 2017

Fisher, Ronald C and Robert W. Wassmer. "Naming Rights as a State Revenue Generator," *State Tax Notes* (June 13, 2016)

Fisher, Ronald C. *State and local Public Finance*. 4<sup>th</sup> ed. London and New York, Routledge, 2016

Geddes, Richard R. *How should America pay for its infrastructure needs?* Washington, DC: American Enterprise Institute, 2015.

Geddes, Richard R. *America's Transportation Challenges: Proposals for Reform*. Washington, DC: American Enterprise Institute, June 2017.

Fox, William F. "Connecticut General Sales Taxation" in the *Final Report of the Connecticut Tax Panel*, Vol 2. Hartford: Connecticut General Assembly, 2016. <https://www.cga.ct.gov/fin/>

Gifford, Jonathan L, "Transportation Finance," in *The Oxford Handbook and State and Local Government Finance*, edited by Robert D. Ebel and John E. Petersen. (Oxford and New York: Oxford University Press, 2012), 594-623.

Gordon, Tracy, Richard Auxier, and John Iselin, **Assessing the Fiscal Capacities of the States**: Washington, DC: Urban Institute, 2012

Gramlich, Edward, "Infrastructure Investment: A Review Essay," *Journal of Economic Literature*, Vol 32, No 3. (1994), 1176-1196.

Gulyani, Sumila. "Willingness to pay for public services," in *The Encyclopedia of Taxation and Tax Policy*, edited by Joseph C. Cordes, Robert D. Ebel, and Jane G. Gravelle. (Washington, DC: Urban Institute, 2005), 471-472.

Hall, Keith U.S. *Factors Underlying CBO's Long Term Outlook for Federal Health Care Spending*. Presentation to the Council for Affordable Health Coverage and the American Action Forum, November 1, 2017. For detail go to the 2017 Long Term Budget Outlook (March 2017). [www.cbo.gov/publication/52480](http://www.cbo.gov/publication/52480)

Henchman, Joseph, *How is the Money Used? Federal and State Cases Distinguishing Between Taxes and Fees*. Washington, DC: The Tax Foundation, March 27, 2013

Kearney, Melissa S, Brad Hershbein, and Greg Nantz. *Racing Ahead or Falling Behind? Six Economic Facts about Transportation Finance in the United States*. A Hamilton Project. Discussion Paper. Washington, DC: Brookings Institution, May 2015.

Kim, Julie. *Handbook on Urban Infrastructure Finance*. Paris: New Cities Foundation, 2016.

Klein, Ezra. *Washington Post*, February 14, 2011

Lindahl, Erik. "Positive Losung, Die Gerechtigkeit der Besteuerung (1919)" translated as "Just Taxation—A Positive Solution" in *Classics in the Theory of Public Finance*, edited by Richard A. Musgrave and Alan T. Peacock, New York. St Martin's Press, 1958

Mak, James, *Tourism And The Economy: Understanding the Economics of Tourism*. Honolulu: University of Hawai'i Press (2004).

Marlow, Justin. "Capital Budgeting and Spending," in *The Oxford Handbook and State and Local Government Finance*, edited by Robert D. Ebel and John E. Petersen. (Oxford and New York: Oxford University Press, 2012), 658-681.

McBride, James. *The State of U.S. Infrastructure*. Washington, DC: Council on Foreign Relations, January, 2018

McNichol, Elizabeth C., *It's Time for the States to Invest in Infrastructure*. Washington, DC: Center on Budget and Policy Priorities, February 23, 2016.

McKinsey & company. *Bridging Global Infrastructure Gaps*. McKinsey Global Institute. October 2017. [www.mckinsey.com/mgi](http://www.mckinsey.com/mgi)

Mercer, Marsha. *Why free College Tuition is Spreading From Cities to States*. Washington: Pew Charitable Trusts Stateline Report

Munnell, Alicia H and Leah M. Cook. "Funding Capital Expenditures in Massachusetts," *Federal Reserve Bank of Boston New England Economic Review* (Marcy/April, 1991): 3-29.

Musgrave, Richard A. "Fairness in taxation," in *The Encyclopedia of Taxation and Tax Policy*, edited by Joseph C. Cordes, Robert D. Ebel, and Jane G. Gravelle. (Washington, DC: Urban Institute, 2005), 137-138.

Mushkin, Selma J and Richard M. Bird, Public Prices: An Overview, in *Public Prices for Public Products*, edited by Selma Mushkin. (Washington, DC: Urban Institute, 1972), 3-26

Mushkin, Selma J., Editor. *Public Prices for Public Products*. Washington, DC: Urban Institute, 1972.

Netzer, Dick. "Differences in Reliance on User Charges by American State and Local Governments," *Public Finance Quarterly* (October 1992). 499-511.

Orszag, Peter R. *Investing In Infrastructure*. Testimony Before the Committee on Finance, United State Senate. Washington: Congressional Budget Office (CBO) July 10, 2008

Pagano, Michael A. Funding and Investing in Infrastructure. Washington, DC: Urban Institute, 2011. [www.taxpolicycenter.org](http://www.taxpolicycenter.org)

Penner, Rudolph, "Fiscal Austerity and the Future of Federalism," in *The Oxford Handbook and State and Local Government Finance*, edited by Robert D. Ebel and John E. Petersen. (Oxford and New York: Oxford University Press, 2012), 894-916

Pew Charitable Trusts, *Intergovernmental Challenges in Surface Transportation Funding*. Washington, DC. 2014.

Richardson, Pearl., “User charges, federal,” in *The Encyclopedia of Taxation and Tax Policy*, edited by Joseph C. Cordes, Robert D. Ebel, and Jane G. Gravelle. (Washington, DC: Urban Institute, 2005), 456-458.

Schanzenbach, Diane Whitmore, Ryan Nunn, and Greg Nantz, *If you Build It: A Guide to the economics of Infrastructure Investment*. The Hamilton Project. Washington, DC: The Brookings Institution, February 2017.

Sjoquist, David L. and Rayna Stoycheva, “Local Revenue Diversification: User Charges, Sales Taxes and Income Taxes”, in *The Oxford Handbook and State and Local Government Finance*, edited by Robert D. Ebel and John E. Petersen. (Oxford and New York: Oxford University Press, 2012), 406-428.

----- "Diversifying Municipal Revenue in Connecticut" in the *Final Report of the Connecticut Tax Panel*, Vol 3. Hartford: Connecticut General Assembly, 2016. <https://www.cga.ct.gov/fin/>

Slack, Enid and Almos Tassonyi, “Funding urban infrastructure in Canada: Overview, Trends and Issues,” in *Funding Infrastructure Who Should Pay*, edited by Richard Bird and Enid Slack (Kingston: McGill-Queens University Press, 2017)

Thuronyi, Victor. “Tax,” in *The Encyclopedia of Taxation and Tax Policy*, edited by Joseph C. Cordes, Robert D. Ebel, and Jane G. Gravelle. (Washington, DC: Urban Institute, 2005), 375.

U.S Census Bureau, 2006, *Census of Finance and Employment, Classification Manual*, Washington, DC: US Government Printing Office, 2006.

U.S. Census Bureau, *Public Education Finances, 2014*. Washington, DC: US Government Printing Office, 2014.

U.S. Census Bureau, 2002 Census of Governments, Volume 4, Number 2, *Finances of Special District Governments: 2002*, Washington, DC: US Government Printing Office, 2002.

U.S. Census Bureau, 2012 Census of Governments, *Individual State Descriptions: 2012*. Washington, DC: US Government Printing Office, 2012.

U.S. Census Bureau, 2013 Census of Governments, *State and Local Government Summary Report, 2013*. Washington, DC: US Government Printing Office, 2013.

U.S. Congressional Budget Office (CBO). *Public Spending on Transportation and Water Infrastructure, 1956 to 2014*. March 2015. [www.cbo.gov/publication/49910](http://www.cbo.gov/publication/49910)

U.S. Congressional Budget Office (CBO). *Factors Underlying CBO’s Long Term Outlook for Federal Health Care Spending*. Presentation of Keith Hall to the Council for Affordable Health Coverage and the American Action Forum, November 1, 2017. For detail go to [www.cbo.gov/publication/52480](http://www.cbo.gov/publication/52480)

U.S. Department of Commerce Bureau of Economic Analysis. Fixed Assets Tables. 20/24/2016. Last Revised 2002. [www.bea.gov/national/faweb/AllFATables.asp](http://www.bea.gov/national/faweb/AllFATables.asp)

U.S. Department of Transportation, *Highway Statistics, 2014*. Washington, DC: US Department of Transportation.

Ulbrich, Holley H. and Steven Maguire. "Infrastructure Funding," in *The Encyclopedia of Taxation and Tax Policy*, edited by Joseph C. Cordes, Robert D. Ebel, and Jane G. Gravelle. (Washington, DC: Urban Institute, 2005), 204-206.

Vickery, William S. "Economic Efficiency and Pricing," in *Public Prices for Public Products*, edited by Selma Mushkin. (Washington, DC: Urban Institute, 1972), 53-72.

Vu, Ha T.T and Robert D. Ebel, "Multitier Monitoring of Infrastructure: Top Down and Bottom UP". Jonas Frank and Jorge-Martinez-Vazquez, eds. *Decentralization and Infrastructure in the Global Economy: From Gaps to Solutions*. Essays in Honor of Dana Weist. Abington, UK and New York: Routledge, 2016.

Wicksell, Knut. "A New Principle of Just Taxation" in the Classics in The Theory of Public Finance, edited by Richard A. Musgrave and Alan T. Peacock. New York: McMillan, 1958. First published in 1896 in *Finanztheoretische Untersuchungen*.

Wallace, Sally, "The Evolving Financial Architecture of State and Local Governments," in *The Oxford Handbook and State and Local Government Finance*, edited by Robert D. Ebel and John E. Petersen. (Oxford and New York: Oxford University Press, 2012), 156-175

----- "Fiscal Architecture of Connecticut" in the *Final Report of the Connecticut Tax Panel*, Vol. 3. Hartford: Connecticut General Assembly, 2016. <https://www.cga.ct.gov/fin/>

Walton, Gary M. and Hugh Rockoff, *History of the American Economy*, 13<sup>th</sup> Ed. Independence, KY: Cengage Press. 2018.

