

# **Funding Long-Term Infrastructure Needs**

## **For Growth, Sustainability & Equity**

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**Prepared for the D.C. Tax Revision Commission**

**June 17, 2013**

(revised September 20, 2013)

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## EXECUTIVE SUMMARY

*“Markets are not perfect, and they cannot solve every problem. But they are extremely powerful and when governments reshape them to serve a public purpose, they can have a tremendous impact.”*

--David Osborne, "Ten Ways to Turn D.C. Around,"

The Washington Post Magazine, 12/19/1990

Economists are fond of markets and market-pricing for many reasons. For example, market transactions establish connections between consumers and producers, transmitting valuable information that helps determine the relative value of different types of goods and services. This, in turn, helps society allocate resources efficiently among competing activities.

Yet, marginal cost pricing has limits – particularly regarding goods and services provided by governments. Many public goods and services have one or both of the following characteristics that make it difficult to “sell” them in traditional market transactions:

1. One person’s consumption of the good or service does not diminish its availability to others (non-rivalrous); and
2. Once produced, excluding someone from enjoying the good or service is difficult or impossible, regardless of whether or not a person has paid for it (non-excludable).

An example would be street lights. The government provides street lights that illuminate the streets and sidewalks, making it easier and safer to move around after dark. When I take a walk at night, my use of the street lights does not leave less light for others to enjoy. Furthermore, government cannot easily tell which pedestrians have paid their taxes and which have not as they walk along the street. Even if the government knew, the government would find it difficult to prevent non-payers from walking on the public streets at night.

These characteristics of “public goods” lend themselves to the creation of economic externalities. “Externalities” are the positive and negative consequences of economic actions that are not mediated through priced market transactions. For example, traveling on a public road is non-rivalrous – but only up to a point. Once a roadway reaches its carrying capacity, the addition of relatively few vehicles can generate noticeable traffic congestion. But, because the drivers of these additional vehicles are not required to compensate their fellow travelers for the traffic congestion that they are causing, they are not discouraged from entering the roadway and therefore create more congestion than they would if they were required to pay for the consequences of their actions. Because externalities allow people to shift costs of their behavior onto others or allow people to benefit from other people’s activities without paying, externalities distort behavior and resource allocation.

General taxes can leave consumers oblivious to the consequences of some of their actions and create no incentives for changed behavior in relation to the public goods or services being consumed. User fees and public service access fees, however, can inform consumers about the impacts of their consumptive behavior and motivate behavior that takes those impacts into account. This paper will show that user fees and public service access fees, to the extent that they are properly designed and executed, can mimic market transactions, thereby generating revenue while simultaneously internalizing externalities to encourage more responsible and efficient use of public resources.

Public service user fees and access fees can be designed so that economic incentives are better aligned with public policy objectives. As a result, the general desire of people and businesses to save money and avoid fees will enlist the private sector's energy to advance public purposes.

Greater reliance upon user fees and access fees may increase the fairness and efficiency of revenue collections while providing the District with an opportunity to reduce general taxes on private economic activity (i.e., taxes on income, sales and the improvement of real property). This is important for the District for at least two reasons:

1. Congress prohibits the District from taxing income earned in the District if it is earned by non-residents. This prohibition on taxing two-thirds of the total income earned in the District creates a structural imbalance in the District's fiscal condition. This imbalance requires higher-than average rates for many taxes on District residents and businesses in order to provide an average level of public services. To the extent that user fees and public service access fees can obtain fair and reasonable compensation from residents and non-residents alike (without imposing taxes on non-resident incomes), general tax burdens on District residents and businesses can be reduced.
2. Reducing taxes on private economic activity can help make the District more competitive with other jurisdictions, helping ensure a vital and diverse economy that can employ a larger share of the District's working-age population.

This report recommends the following specific fees:

#### USER FEES

- Pay As You Throw solid waste collection fees.
- Impervious surface fees
- Performance-based parking fees
- Clean Air Compliance Fee
- Mileage- and congestion-based transit user fees
- Mileage- and congestion-based roadway user fees.

#### PUBLIC SERVICE ACCESS FEES / VALUE CAPTURE

- Re-Orient the Property Tax To Become a Public Service Access Fee
- Benefit Assessment Fee
- Long-Term Land Leases

All of these recommended fees are used somewhere. However, some of them are not used in the District at the present time. And some that are used could be used more robustly or with modifications that would make them more effective.

## INTRODUCTION:

The DC Tax Revision Commission was established in 2012 to help the District achieve the following objectives:

1. Provide for fairness in the apportionment of taxes;
2. Broaden the tax base;
3. Make the District's tax policy more competitive with surrounding jurisdictions;
4. Encourage business growth and job creation; and
5. Modernize, simplify and increase transparency in the District's tax code.

After World War II, the federal government increased its funding of public infrastructure such as highways, water and sewer treatment and distribution, transit, etc., particularly in suburban areas. As a result, infrastructure in many post-WWII suburbs was more modern than in central cities and had lower operations and maintenance costs (at least initially). Heavily-subsidized new infrastructure and cheap gasoline were two factors among many that provided suburbs with a competitive advantage over central cities regarding the attraction of new residents and businesses.

Today, suburban infrastructure is aging. Due to relatively low development densities, the per capita costs of operating, maintaining, rehabilitating and replacing suburban infrastructure are high and the federal government is scaling back its financial support for suburban infrastructure. Combined with much higher costs for gasoline and high levels of roadway congestion in some suburban areas, central cities are becoming more competitive, particularly with younger people who want to be less dependent physically and less burdened financially by an auto-oriented lifestyle.

In light of these trends, what set of revenues can help fund the creation, improvement and maintenance of essential infrastructure in the District of Columbia in order to maximize its economic competitiveness with its surrounding jurisdictions while also being fair, efficient, simple and transparent?

To answer this question, this paper will examine the supply of and demand for long-term infrastructure such as transportation facilities and services, schools, police & fire protection, water purification and sewage treatment, power production & distribution, etc.

### Funding Versus Financing

A lot of the discussion about infrastructure discusses financing techniques. “**Financing**” is the process of utilizing a stream of future revenue or income to pay for something that costs more today than the cash on hand to pay for it.

The most familiar form of financing for many people is the home mortgage. Based on a lender's recognition of a borrower's stable and adequate income, a lender will provide a prospective homeowner a percentage of the value of a house (typically less than 100%), in

exchange for the homeowner's promise to pay off the principal and interest over a period of years. The interest payment compensates the lender for the "service" of making the cash available and is also intended to cover a variety of risks associated with lending funds. Until the mortgage is paid off, the lender holds the title to the house and the land. In the event that a homeowner defaults on the mortgage loan, the lender perfects its title pursuant to a foreclosure proceeding and can recoup its funds, to the extent possible, by disposing of the property.

There are many financing techniques. Essentially, they all require a stream of revenue from which to repay a loan. In other words, municipal bonds and other financing techniques are not sources of funds. Instead, they re-allocate future tax revenues to the present time. (Thus the true "sources of funds" are future tax revenues.) Because many infrastructure assets (like roads, bridges, sewers, etc.) are long-lived, it is fair that future taxpayers should contribute to their funding. Financing tools can be equitable and useful in this regard. But there will be less flexibility in allocating future tax revenues as a result. "**Funding**" is the process of identifying and securing sources of revenue necessary to pay for the construction (including debt service), operations, maintenance and replacement of infrastructure projects. Thus "funding" is a pre-requisite for "financing." This paper will focus on "funding" rather than on "financing."

### What Is Infrastructure?

The private sector is not always the most effective or efficient arena for the production and distribution of important goods and services. According to Abraham Lincoln, "The legitimate object of government is to do for a community of people whatever they need to have done, but can not do at all, or can not do so well, for themselves in their separate and individual capacities."<sup>1</sup>

"Infrastructure" refers to the physical and organizational structures and facilities necessary for the operation of society.<sup>2</sup> Infrastructure facilities would include streets and sidewalks, water purification and distribution systems, power production and distribution systems, municipal buildings, etc. Organizational infrastructure would include the legislative, executive and judicial branches of government. These facilities and organizational structures are generally difficult for the private sector to provide under a traditional business model.

Public services such as courts, police and fire protection, and schools (to name only a few) are complex managerial undertakings. Physical infrastructure is also complex. Building streets, laying tracks for transit, and providing water and sewer pipes is not enough. Everything that people build eventually falls apart and must be rebuilt. A program of careful operations and maintenance, combined with a program of occasional rehabilitations can extend the life of physical infrastructure assets. But nothing lasts forever. Even public services such as education, police and fire protection and sanitation, which are not thought of as physical infrastructure, rely on physical assets such as school buildings, police and fire stations, police and fire / EMS equipment, etc.



Physical infrastructure assets are often so extensive, pervasive and expensive, that their reconstruction or replacement can be very disruptive for private sector activities, municipal operations and for municipal budgets. This paper will focus on the municipal financial burden. How does the District of Columbia ensure the sufficient and equitable collection of funds necessary to meet its long-term capital needs in a way that does not unduly burden its current and future residents and businesses?

Several questions must be addressed regarding the District's long-term infrastructure needs:

- Who should pay?
- How much infrastructure capacity is required?
- What are the differences between general taxes and user fees?
- Are there advantages to user fees?
  - Can the user-fee concept be applied to infrastructure funding?
  - Are some of the advantages of user fees also applicable to infrastructure access fees?
- Are infrastructure user fees and access fees consistent with the criteria established by the D.C. Tax Revision Commission?

### Who Should Pay?

People who live in the District of Columbia clearly benefit from its public goods and services – and from the physical infrastructure that makes their delivery possible. Therefore, District residents should help pay for the District's long-term infrastructure needs. Likewise, businesses located within the District benefit from its public goods and services and should also help pay for the District's long-term infrastructure needs.

As has been mentioned earlier in this report, the beneficiaries of the District's physical infrastructure include more than merely the District's residents and businesses. The District's physical infrastructure makes it possible for many people to earn their income here, even though they may reside in another jurisdiction. Approximately two thirds of the total income earned within the District is earned by non-residents.<sup>3</sup> Most of these non-resident employees have homes in the Maryland and Virginia suburbs, but some commute from as far away as West Virginia, Pennsylvania and Delaware.<sup>4</sup> Thus, when the District's provision of public goods and services makes it possible for non-residents to earn their income, it would seem to be reasonable that these non-residents should also help pay for those public goods and services.

A general rule of taxation is that income is taxable where it is earned. The United States and many other countries tax income earned by foreigners if it is earned within their country.<sup>5</sup> The states that impose an income tax establish tax liability based primarily upon residence. But this is accompanied by an assumption that people who live in a state earn their income there as well. In circumstances where this assumption is not valid, another type of arrangement is common.

For example, in Philadelphia, New York, Chicago and other cities, services of one jurisdiction may help the residents of other jurisdictions earn their incomes. In many of these cities, their states employ a **reciprocal income tax** where taxes are levied on out-of-state employees who earn their income within each of those cities. (Residents of those cities who work in a different state, likewise, owe income taxes to the state where their income is earned.)

Thus, workers make income tax payments to the jurisdiction that provides the public goods and services necessary to help them earn their income. If they live in another jurisdiction, the tax paid to their employment jurisdiction becomes a credit that is applied against the tax that they owe to their home jurisdiction. However, through the Home Rule Act, the United States Congress prohibits the District of Columbia Government from employing a reciprocal income tax agreement with other jurisdictions.<sup>6</sup>

An additional limitation on revenue-raising arises from the fact that many of the organizations that operate in the District of Columbia are governmental agencies, foreign missions or non-profit entities that are not subject to taxation. Yet these organizations and their employees require police and fire protection, transportation and environmental services. According to the Government Accountability Office in a report from 2003, if the District taxed its taxpayers at rates more typical of other jurisdictions, the District would experience a budget deficit of between \$470 million to \$1.1 billion.<sup>7</sup> The 2003 GAO report refers to this situation as a “structural imbalance.” “GAO defines [structural imbalance] as a fiscal system’s inability to fund an average level of public services with revenues that it could raise with an average level of taxation plus the federal aid it receives.”<sup>8</sup>

Of course, the District is not permitted to run a deficit, so the District’s taxpayers are compelled to make up the difference. Thus, when it is mentioned that a particular District tax rate is higher than the national average, the District’s “structural imbalance” is perhaps the first place to look for an explanation.

As the nation’s capital, the District’s infrastructure also serves many visitors from across the country and around the world. Although there is no opportunity to impose income taxes on these people, they are subject to other taxes and fees that can help contribute toward the provision of the public goods and services that they consume. These would include taxes on hotels rooms and restaurant meals along with sales taxes on parking and consumer purchases. (However, pursuant to Congressional legislation, sales at the Smithsonian Museum restaurants and gift shops are exempt from the DC sales tax.)

Most physical infrastructure has a long useful life. Buildings may last for 50 to 100 years or longer. Streets require periodic rehabilitation and reconstruction, but typically last for many decades. For this reason, future generations will benefit from these facilities and it is reasonable for future generations to help pay for them. (This is the rationale for infrastructure financing that borrows money which is then repaid, in part, by future generations.)

## **PART I: HOW MUCH INFRASTRUCTURE CAPACITY IS REQUIRED AND HOW DO TAXES AND FEES INFLUENCE THE DEMAND FOR INFRASTRUCTURE?**

### **INFRASTRUCTURE CAPACITY**

An important preliminary question concerns the amount of infrastructure capacity necessary to meet current and future needs. Estimates of future population, employment and visitation (both for business and tourism) can establish parameters for infrastructure requirements. The Office of Planning, the Metropolitan Washington Council of Governments, and several other entities devote considerable effort to making and revising estimates in this regard.<sup>9</sup> But there are other determinants of required infrastructure capacity, in addition to population and employment, which are not necessarily obvious.

#### Roadway Capacity

A common misperception is that traffic congestion is caused by too many people in the same place at the same time or, conversely, too little roadway space for the number of people seeking to travel. This emphasis on the number of people is only partly relevant.

Cars take up a lot of space, even when parked. When they are moving, drivers are instructed to keep one car length for every 10 miles per hour of speed between them and the car in front of them. A street segment can appear congested (because it is full of cars). But if each car has only a single occupant, the street segment may be transporting relatively few people. While the number of people traveling is an important factor in creating congestion, the mode by which they travel – walking, biking, transit, carpool or single-occupant vehicle (SOV) – is equally important, as the photos show below.

The following pictures, taken by Phil Sheffield for an article in the July 18, 1999 issue of The Tampa Tribune by Jim Beamguard, show 40 people on a Tampa street using different modes of transportation.



Photo #1 above shows 40 people in 40 cars parked nose-to-nose.



Photo #2 shows the same people without the cars, and chairs placed where the drivers were sitting in photo #1.





Photo #3 shows the same 40 people arranged as if they were sitting on a transit bus.



Photo #4 shows these people, 10 as cyclists and 30 as pedestrians.

*All photos © The Tampa Tribune.*

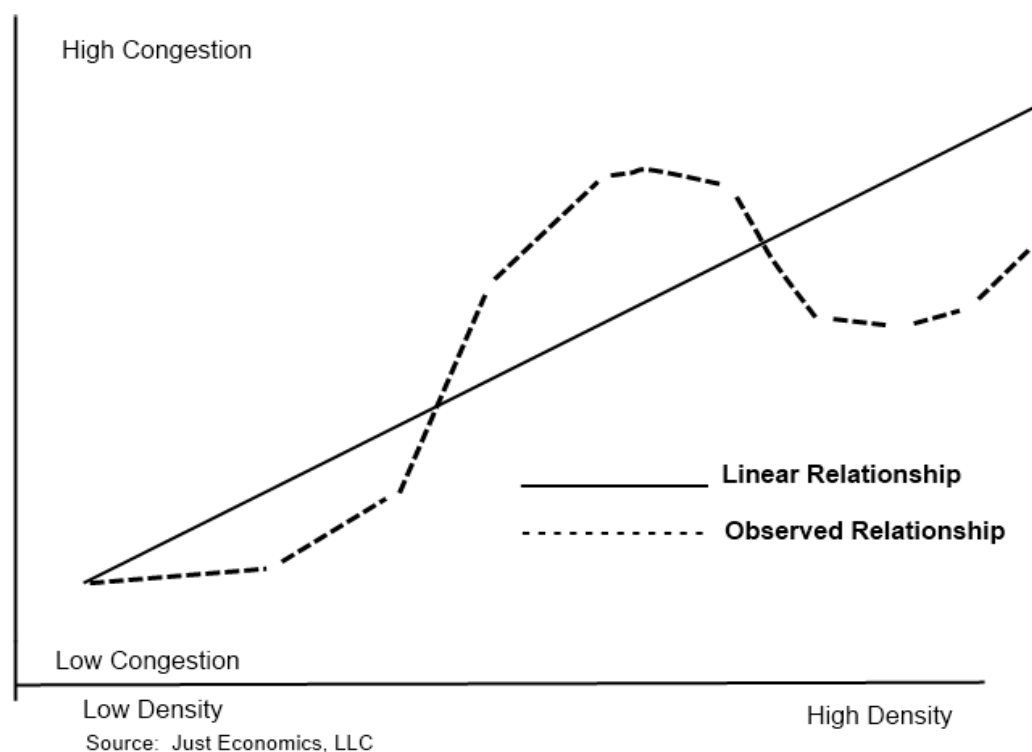
*Reproduced with the kind permission of The Tampa Tribune.*

Clearly, different modes of transportation consume different amounts of space per person.

Cars are often a convenient and efficient way to travel. Yet in some circumstances, walking, cycling or transit can be comparably convenient and more efficient regarding the use of public space. In the Washington, DC Region, over 80% of daily household trips are not commuting trips.<sup>10</sup> The median distance for such non-commuting trips is about 4 miles and 25% of these trips are less than 1.5 miles.<sup>11</sup> Thus about 20% of daily household trips are within a reasonable distance for biking and walking.<sup>12</sup>

However, when government policies make it cheaper to drive and park than to take transit, and when sidewalks and bike lanes are often missing, most people will choose to drive and park, even for short trips. This proclivity for driving consumes enormous amounts of roadway space. (Of course, it also consumes inordinate amounts of energy, pollutes air and water resources, and contributes toward global warming and our lack of daily exercise.)

#### Impact of Land-Use Density on Traffic Congestion



Some defend sprawl by claiming that it reduces congestion. It is certainly true that low-density rural areas will have less traffic congestion than intensely-developed urban areas. However, what some people don't realize is that the worst congestion can sometimes occur in areas of

medium density and segregated land use (suburban sprawl). There, each and every daily activity outside the home requires an automobile trip.<sup>13</sup> It is not density per se that reduces congestion, but density in combination with mixed land uses and grid streets that create the opportunity for walking, cycling and economically viable transit services.<sup>14</sup>

Just as the choice of transportation mode can influence the adequacy of roadway capacity, the way in which infrastructure is funded and financed can also help determine demand. After WWII, the federal government's paradigm for funding new suburban infrastructure appeared to be "Everything for everyone everywhere all-the-time for free."<sup>15</sup> The costs to build this new infrastructure were hidden behind general tax subsidies. The costs to suburban jurisdictions for construction were typically limited to a "match" for the federal grant. These match requirements ranged from 0% to 20% in the interstate highway arena – and state governments typically picked up this cost. Initial costs to suburban jurisdictions to operate and maintain this infrastructure were relatively low because the facilities were new.<sup>16</sup> Budgeting for the future rehabilitation and replacement of these facilities brought no political rewards and therefore, was generally ignored.

One of the primary financial features of this period was the use of general taxes (income, property and sales taxes) to pay the debt service on long-term bonds used to pay for this new suburban infrastructure. As our dispersed land use patterns made per capita infrastructure consumption increase dramatically, there was less and less cognitive connection between our use of infrastructure and our perception about how we were paying for it.<sup>17</sup> While we became more and more dependent on the auto, we became more aware of traffic congestion and smog, but less aware about our own role in creating these problems.<sup>18</sup>

With regard to parking, for example, if parking facilities are completely subsidized and are made available at no perceived cost to drivers, the demand for parking spaces in high-demand locations might seem almost infinite. For example, many vehicles can be observed cruising for parking in Georgetown, along the National Mall near the Smithsonian museums, and in other parts of the downtown. Donald Shoup, a professor who has made a career out of studying parking, estimates that as much as 30% of urban traffic has already arrived at its destination, but is cruising for parking.<sup>19</sup>

Drivers might be lured downtown by promises of cheap parking. But if they arrive and find that all of the parking is occupied, they may feel that they have wasted their time. Perhaps they won't come back. On the other hand, if the scarcity of parking was made apparent through higher parking prices (based upon supply-and-demand), then cost-avoiding behaviors such as carpooling and transit would get more people downtown while reducing the number of cars seeking parking spaces. The net result would expand the total number of people gaining access to downtown by all modes of travel.

Careful attention to transit pricing, roadway pricing, parking pricing and the provision of bicycle and pedestrian facilities can help people make choices about when to drive and when to walk, bike, carpool or use transit. If properly planned and implemented, the end result can help maximize access to businesses, schools, shopping, recreation and cultural activities while minimizing needs to increase lane-miles of roads.

#### The Infrastructure Conundrum: How Infrastructure Can Encourage Sprawl

Public infrastructure is generally considered to be one of the pre-requisites for development. In general, public infrastructure (such as roads, water and sewer systems, power production and distribution systems, public schools, police and fire protection, etc.) are created to help facilitate private development. The clustering of development around public infrastructure facilities is considered to be a defining characteristic of “smart growth.”

Yet, if “smart growth” is so smart, how come there’s so much dumb growth (sprawl) to be found? Part of the explanation lies with the way in which the value of public infrastructure is translated into land prices.

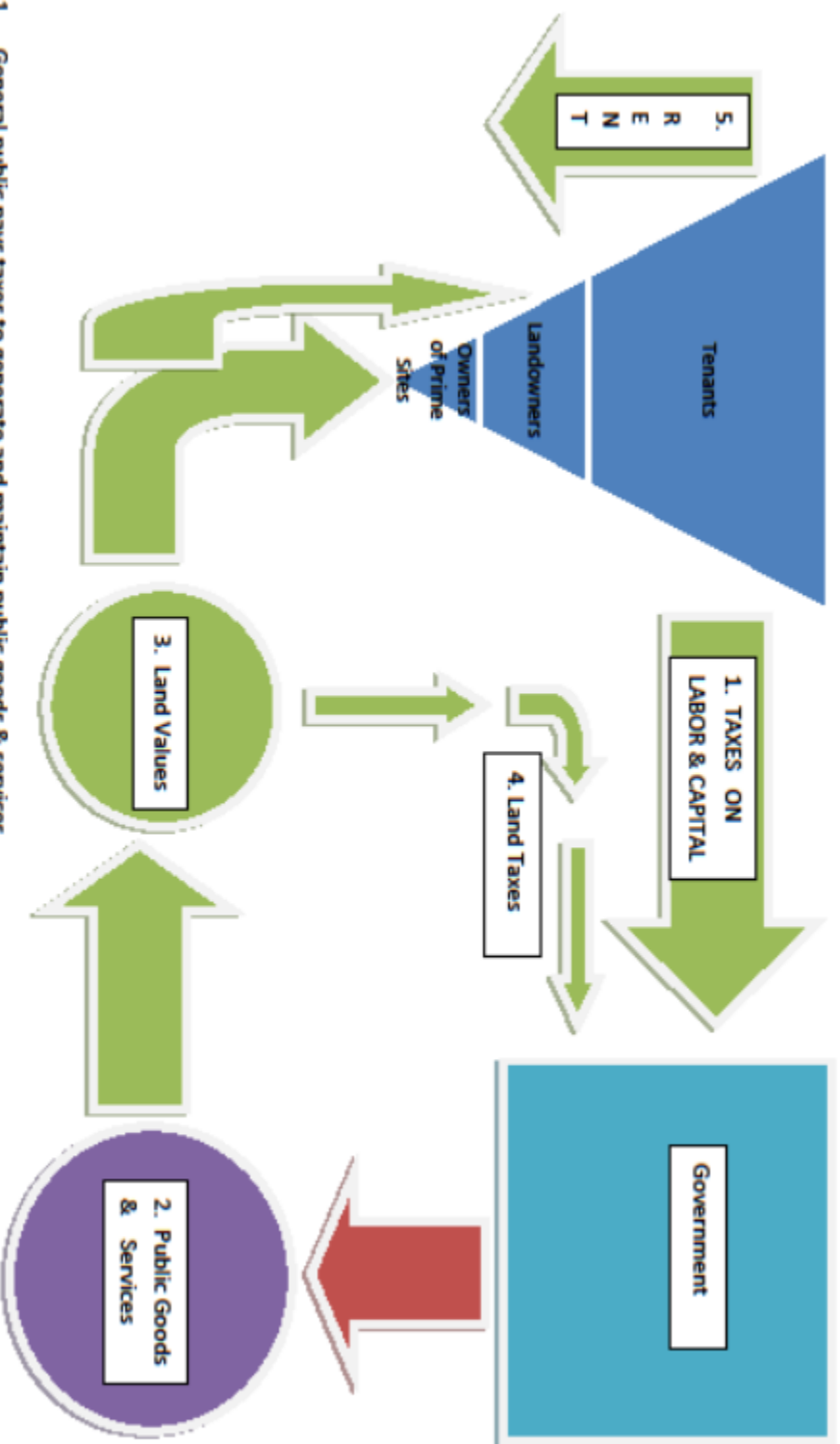
When infrastructure is well-designed and well-executed, it inflates the price of well-served land. Higher land prices chase some development to cheaper, but more remote sites. As these remote areas develop, businesses and residents there demand more infrastructure. Even though there may be plenty of unused capacity where infrastructure was initially provided, infrastructure will be extended (at great expense) to new development areas. However, the extension of public infrastructure to new development areas starts the process over again – inflating land prices and chasing new development even farther away from the initial development center.<sup>20</sup>

Infrastructure intended to facilitate development chases some development away. The ensuing sprawl not only impairs the environment by urbanizing rural lands, it also impairs municipal budgets that must now build, operate, maintain, rehabilitate and replace a much more extensive (and therefore more expensive) infrastructure network than would have been required if development had clustered around the initial set of infrastructure facilities.<sup>21</sup>

The following image shows how the provision of public goods and services inflates the value of prime sites. It also shows how the public ends up paying for infrastructure twice – once through taxes and a second time through higher land payments required to access that infrastructure.



## LAND VALUE CREATION & CONSEQUENCES



1. General public pays taxes to generate and maintain public goods & services.
  - a. Owners of prime sites contribute less than others because most of their taxes are passed through to tenants and customers.
2. Governments use taxes to produce public goods & services
3. Benefits of many public goods & services are capitalized into higher land values ("Location, location, location!")
4. Typical property taxes return only 1% or 2% of publicly-created land value.
5. Most land values created by government are windfalls to owners of prime sites who charge premium rents to tenants for the right to access these public goods and services. NOTE: Tenants pay twice for government services. Once in taxes & again in land rent.

Thus, the demand (and cost) for infrastructure is determined not only by the number of residents and businesses being served, but also by how these residents and businesses locate themselves across a region. The more dispersed the development patterns, the more expensive will be the infrastructure – both in absolute and in per capita terms. And, more dispersed land use will encourage people to make more of their daily trips by single-occupant vehicles (SOVs) than by other modes.

Thus, while projections for changes in population and employment provide essential information about the future demand for public goods and services, this demand can be heavily influenced by land use, the methods chosen for funding infrastructure and transportation mode choices.

### **General Taxes Compared to User Fees**

Some types of public payment for infrastructure (such as the payment of general taxes to pay off bonds) bear little or no relationship to the frequency or intensity of infrastructure use – and therefore create no economic incentives for conservation or off-peak use. However, to the extent that user fees are more directly related to the consumption of public goods and services, user fees can moderate or shift demand for public goods and services to promote greater efficiency.

#### Infrastructure User Fees:

Many economists are fond of user fees for providing revenues. There are several reasons for this. First, those who use infrastructure (and who create the need to maintain and replace it) would appear to have a justifiable obligation to pay for it. Also, establishing a nexus between the use of infrastructure and the payment for it creates an economic incentive for consumers to curtail their demand.

When road use is free (or appears to be free), there is no price incentive for drivers to avoid congested roads. People who may have a minimal need to travel or to arrive somewhere at a particular time might be creating congestion that impedes people who have a high need to travel and to arrive at their destination on time. Due to the non-linear nature of roadway congestion, the addition of relatively few vehicles on a roadway segment can dramatically worsen congestion if those vehicles enter that roadway when it nears its carrying capacity.<sup>22</sup>

This degrades the quality and functionality of the transportation system. If roadways were priced, and if traveling on congested roads was more expensive than traveling on uncongested roads, then people who have a minimal need to travel or arrive somewhere at a particular time would be encouraged to travel off peak – or on less-congested roadways – and this would enhance the quality and functionality of the existing transportation system.

### Roadway User Fees

Most of us are familiar with toll roads and bridges. Historically, these have been flat fees or distance-based fees. New technologies make it possible to implement more sophisticated approaches to roadway pricing.

Some possible metrics for determining roadway user fees:

- **Distance Traveled.** Compensates for:
  - Extensiveness of the Roadway Network
  - Storm Water Management
- **Vehicle Weight.** Compensates for:
  - Wear & Tear on Roadway Network
- **Level of Roadway Segment Congestion:** Compensates for:
  - Consumption of Roadway Capacity When Capacity Is Scarce
- **Vehicle Emissions:** Compensates for:
  - Impairment of Public Health and Pollution Mitigation

Residents of the Washington Metropolitan Region have experience with roadway pricing and tolls. Interstate 95 between Delaware and Boston is extensively tolled as are the bridges and tunnels into New York City. The Pennsylvania Turnpike (I-76) running east and west across Pennsylvania is tolled. The Chesapeake Bay Bridge and the Fort McHenry Tunnel carrying I-95 beneath the Baltimore Harbor are toll facilities. Roadway pricing has also been introduced on the Dulles Toll Road, the Dulles Greenway, some Virginia segments of the Beltway (I-495), Maryland's Inter-County Connector (MD-200) and will soon appear on segments of I-395 and I-95 in Virginia.

While pricing a unique facility is not uncommon, it is relatively rare to find roadway pricing that applies to a citywide roadway network. Internationally, some examples of this approach have been implemented in London, Stockholm and Singapore. These cities experienced dramatic reductions in roadway congestion when roadway pricing was applied to all roads within the city or the city center.<sup>23</sup>

Roadway pricing does not change the behavior of most drivers – but it doesn't have to. As mentioned previously, discouraging a small number of drivers at the right time in the right place can dramatically reduce congestion. Reducing congestion can be a benefit for bus transit patrons as well as for automobile drivers. Reductions in congestion also speed up freight deliveries and thereby reduce the cost of goods for many consumers.

### Transit User Fees

The regional Metrorail subway system charges passengers by a complex formula. There is a flat fee for entering the system and traveling the first three miles. After three miles, there is an additional fee that varies both by distance and by time-of-day. Thus, Metrorail employs both distance-based and congestion-based pricing. Distance-based fees recognize that riders who travel longer distances consume more energy and create more wear and tear on

the equipment. Distance fees also encourage people to locate closer to the activities that they engage in on a regular basis. Congestion-based fees encourage riders to travel at off-peak times and help conserve capacity during the busy morning and afternoon peak periods. Thus, Metrorail fare policy influences rider travel and land-use behavior in ways that can help foster system efficiency.

WMATA's Metrorail fare policy exists in stark contrast to its early parking pricing policy. For many years, WMATA charged between \$1 and \$2 for daily parking at its stations where parking was available. During this period, Metrorail parking lots often filled up early, some as early as 7am, denying auto access to Metro to those arriving by car later in the day.

In recent years, WMATA has become more sophisticated about parking pricing.<sup>24</sup>

- Daily rates are now as much as \$5.
- Some parking spaces are set aside for short-term hourly parking (@ \$1/hour)
- Some spaces are available to be "reserved" at a premium price.

By pricing parking at Metrorail stations more closely to prices that would be dictated by supply and demand, more people are encouraged to access Metro by modes other than SOV. (These other modes include walking, cycling, bus transit, taxi, carpool, kiss-and-ride, etc.) This allows more people to access the system than if everyone were simply driving alone to the stations. Enhancing access to Metrorail results in greater system utility and greater fare revenue. Reserving some spaces for short-term parking spreads out ridership more evenly throughout the day. This reduces peak hour costs and creates greater system efficiency. Providing access for auto users arriving after the morning rush hour makes the system convenient for a wider variety of patrons. Given this array of benefits, the additional parking revenue almost seems like a bonus.

In this regard, transportation user fees constitute more than mere money. Roadway, transit and parking prices are information and help people make decisions about how, when and where to travel. Prices that reflect congestion, therefore, require people to make a payment in recognition that their presence on a crowded roadway, transit vehicle or parking facility will inconvenience others who also desire to use these facilities. Thus, the impact of a person's behavior on the well-being of others can be transmitted through the pricing system.

#### Externalities & Non-User Benefits

Of course, the notion of user fees has its limitations. For example, if Metrorail charged riders for the entire cost of the service, fares would be so expensive that very few people would be able to afford to use it. Yet many of the broader public benefits from public transportation (traffic congestion reduction, pollution reduction, economic development opportunities) are only achieved if many people are riding transit.

Some people receive benefits from transit even if they don't ride it. This raises the issue of "externalities." Externalities are benefits or costs that are produced by economic activities but not mediated through market transactions and prices. Here are two familiar examples:

- A steel factory produces smoke that makes its neighbors sick. The factory does not compensate the neighbors. Thus, the neighbors are subsidizing the factory's waste disposal process and the factory produces more smoke than it would if it had to pay for the consequences.
- People who don't ride transit benefit from it. Drivers experience less traffic because some travelers are using transit. Transit use reduces fuel consumption per traveler and everyone benefits from cleaner air as a result. If transit only received revenues from its riders, less transit would be provided because many of its beneficiaries would not be paying for the benefits they receive. Thus, transit would not have the revenues needed to provide an optimal level of service (and benefits) for the entire community.

Thus, transit fares typically cover only a portion of total transit costs. In most jurisdictions, general tax revenues are used to cover the remainder of costs based on the notion that all taxpayers are benefiting from transit even if they don't ride it. However, transit subsidies from a jurisdiction's general fund (raised via sales, income or other general taxes) typically fail to influence public transportation or land use behavior in a way that will make the transportation system more effective or efficient.

One possible solution would be to pay for some transit costs out of distance- and congestion-based roadway user fees. This more modern version of a roadway toll would raise substantial revenue, raise that revenue from drivers who benefit from transit, and would motivate drivers to moderate their driving behavior in a way that helps make the roadway transportation system more efficient and effective. In the District, driver subsidies for transit would also be more equitable for several reasons:

- Almost every driving route into the city has a transit alternative. Thus, transit facilities and services provide a direct benefit to most drivers.
- About 305,000 cars come into the District every weekday.<sup>25</sup> About 25% of that traffic has neither an origin nor a destination in the District, but is merely cut-through traffic from one suburb to another.<sup>26</sup> Yet these drivers create congestion for each other and for those who are using transit buses and taxis as well.

#### Infrastructure Access Fees To Internalize Externalities

In the 1890s, the District's streets were mostly unpaved. In dry weather, the roads were dusty and rain made travel very difficult. Paving the streets and sidewalks would clean the air and make everyone better off. Thus, Congress could have chosen to pay for street paving out of general taxes. But Congress realized that some people would receive an additional benefit.

Owners of property adjacent to paved streets would find that no longer were people tracking dust, mud and manure into the homes and businesses that they owned. Even if these property owners never walked on the newly paved streets or sidewalks, they would benefit financially through higher rents and sales prices. Thus Congress enacted a law mandating that 50% of the first-time paving of streets would be paid for by adjacent landowners.<sup>27</sup>

Also during the 1890s, the Chevy Chase Land Company (CCLC) bought about 1,700 acres of land near the DC – Maryland border. The land, primarily agricultural land and forest, was quite cheap because it was difficult to get to the downtown jobs and stores from there. CCLC then built a streetcar line out Connecticut Avenue. The fare to ride the streetcar was relatively modest – a few pennies – and did not compensate CCLC for the capital costs of the streetcar.

But building the streetcar was not an act of charity or altruism. CCLC recouped its costs and more, not through fare box revenue, but through increases to the value of their land. CCLC could now sell their lots at substantially higher prices because there was cheap and convenient transportation from “Chevy Chase” to the District’s downtown.<sup>28</sup> If CCLC had attempted to recover all of its streetcar costs through higher fares, very few people would have ridden the streetcar and land values in Chevy Chase would not have risen very much. In other words, attempting to recover all the costs of the streetcar through the fare box would have doomed both the streetcar and the land development effort.

Thus, there is an important set of beneficiaries of the transportation system who might not necessarily drive on District roadways or ride its transit. These beneficiaries own land near key roadway intersections and transit stations. They might never ride a transit vehicle or drive on a DC street, but they are enriched by the District’s transportation system which makes their land more accessible – and therefore more valuable – than it would be otherwise.

A more modern example of this situation can be found in the area surrounding New York and Florida Avenues, NE. During the last century, many acres adjacent to the railroad tracks north of Union Station were used for railroad sidings where freight trains were loaded and unloaded. As trucking took over the freight business, the railroad sidings became obsolete and were demolished in the 1970s. This land remained largely vacant for several decades.

When landowners approached the District Government for development permits in the mid 1990s, their requests were denied. The permit office noted that North Capitol Street, Florida Avenue and New York Avenue were already heavily congested during rush hour. The permit office stated that these congested streets were the only means of accessing development in this area. Therefore, granting development permits would make this traffic congestion even worse. The permit office noted, however, that the Metrorail Red Line tracks were nearby. If only there were a Metro station in that vicinity to provide an alternative source of access, the requested development permits could be granted.

The landowners approached the District Department of Public Works (DPW) -- now the District Department of Transportation (DDOT) -- about whether the District could build a new Metrorail station in this vicinity. A DPW official attending that meeting noted that the District would like to see a Metrorail station in that area, but that the District lacked the funds to build it. Noting that the land would be much more valuable if a transit station was there, the official suggested that landowners should contribute funds if they wanted it built. Some months later, there was an announcement from the mayor's office that landowners had offered to pay \$25 million for the creation of a new Metrorail station in this area.<sup>29</sup>

This concept works for more than roads and transit. In another example, a series of flood control dams were built along the Miami River in Ohio. The dams were paid for by an assessment on neighboring landowners whose properties were made more valuable as a result of the flood protection provided by the dams.<sup>30</sup>

These few examples show that, at least for some types of infrastructure, landowners benefit from mere access to infrastructure – even if they don't use it directly. The value of access to infrastructure typically manifests itself in the price of land. Infrastructure-created land values are an often overlooked, but potentially important source of infrastructure funding. Tapping land values for infrastructure funding is often referred to as “**value capture**.” I use the term “public service access fee” because I think it more clearly communicates the nature of the value being captured.<sup>31</sup>

#### Relationship between User Fees and Access Fees

Most people understand the user fee concept. If I drink a gallon of water, I should pay the water authority for cleaning and transporting the water that I just drank. If I flush a gallon of sewage, I should pay the sewage authority for transporting and cleaning my sewage.<sup>32</sup>

The access fee might be more difficult for some to understand. If I own a vacant lot, should I pay anything to the water and sewage authorities? After all, nobody is drinking water at my vacant lot and nobody is flushing any sewage. But think about a city where many people want to live and work in the downtown – or close to it. There are two vacant lots in different neighborhoods. Each is 2 miles from the city's center. The lots are identical in almost every respect, except that Lot #1 has access to water and sewer pipes at the property line. Lot #2 has no water or sewer pipes within a mile of the property.

Which lot will be more valuable? Lot #1, that has access to water and sewer lines, will be more valuable than Lot #2. Note that Lot #1 is more valuable, not because of any work by the owner, but because the water and sewer authorities, by extending their pipes to the edge of this property, have made Lot #1 less costly to develop. Thus landowners whose properties have access to valuable public goods and services are enriched by the public even when these public goods and services are not actually consumed. Based on this enrichment, these landowners should pay a “public service access fee.”

### What is the Basis for a Public Service Access Fee?

If providing public goods and services enriches property owners who are not even using their sites, what is the appropriate basis for charging a public service access fee? The value of public goods and services provided to property owners (along with the value of community-provided externalities) is reflected in the value of land. Therefore, a public service access fee would appropriately be based on the value of the land being served.

Assume several identical houses, each on a quarter-acre lot in different neighborhoods. We would expect each home to sell for a different price. One neighborhood might have a better neighborhood school. Another might be closer to jobs, shopping or transportation to jobs and shopping. Another neighborhood might be closer to a park. Yet another neighborhood might be perceived as being unusually safe. Another neighborhood might have all these amenities, but be located next to a congested roadway beneath a flight path to a busy airport. All of these opportunities and externalities (both positive and negative) are reflected in the price that people are willing to pay for identical structures. If the structures were removed, the total property value would decline by the amount of the value of the structure, but the remaining value of the unimproved lots would remain and would reflect the different value of public goods and services in each neighborhood. The price of farmland might be related primarily to the fertility of dirt. But in urban and suburban areas, the price of land is related to the value of public goods and services provided at its “location, location, location.”

### Incentive Effects Associated with Access Fees

As mentioned above, user fees do more than merely pay for infrastructure. They inform consumers about how valuable these public goods and services are and they encourage conservation. (If there is no fee for consuming public water, there is no economic incentive to fix leaky pipes.) Likewise, public service access fees, if properly structured, can also create beneficial incentives.

If no access fee is charged (or if the fee is much too small), then increases in land value generated by access to public infrastructure are a pure windfall to landowners who are lucky or shrewd enough to own well-served sites. Absent an access fee, landowners might be inclined to forego development of well-served sites on the supposition that these sites might become even more valuable in the future. When landowners withhold sites from development at current market prices, this can create an artificial scarcity of developable land. This artificial scarcity can result in real increases in land prices as developers bid for a curtailed supply of development sites. This rise in land prices encourages even more speculative land hoarding.<sup>33</sup>

The paragraph above shows how land speculation can become a self-fulfilling prophecy. Withholding prime land from development shrinks the supply of development sites leading to land price increases leading to more withholding of prime sites from development and even more land price increases. But this self-fulfilling prophecy can also become a self-defeating one. If residents, businesses, developers and other land users are priced out of the market for prime land, they will be forced to locate on cheaper, more remote and less productive sites.



This impairs their productivity (typically through higher transportation costs). It also damages the environment by prematurely urbanizing agricultural, recreational and conservation lands. Additionally, it impairs municipal budgets by creating demand to duplicate expensive infrastructure at these remote locations – even though there is unused capacity at prime locations.

Once a substantial amount of development has been diverted away from prime sites, prime sites can become less “prime” as development interest shifts to new development areas.<sup>34</sup> Also, as speculation prices out land users, speculators end up buying and selling from one another without heed to the value of land because of their certainty (based on past trends) that its price will continue to rise. During this phase of the boom-and-bust cycle, land prices become a price “bubble” because prices are no longer related to what land users are willing to pay.<sup>35</sup>

Consumers and businesses, burdened by high land prices, rents and higher transportation costs (related to an inability to afford “prime” locations), end up spending less on consumption and production. The economy goes into decline. The economic decline reduces the demand for land and highlights the fact that existing land prices far exceed what land users will pay, thereby bursting the speculative bubble.<sup>36</sup>

During the “boom” phase of the speculative cycle, residents and businesses are frequently outbid by speculators when they try to get control of land for homes or businesses. During the “bust” phase, residents and businesses may be too impoverished to bid for land or unable to obtain credit. Alternatively, those who can still afford to bid on land at its current market price may find landowners unwilling to sell because selling at current market prices entails taking significant financial losses if the current landowners bought their properties during the “boom” phase. Thus, during both the “boom” and the “bust” phase of the economic cycle, ordinary residents and businesses can find it difficult to get access to land at reasonable prices.

#### Public Service Access Fees Encourage Smart Growth & More Affordable Land

This heading may seem counter-intuitive. Typically, when we charge a fee for something, it makes that thing more expensive. However, because land is not produced, there is no reduction in the supply of land after a fee is assessed on it. Also, charging a public service access fee reduces the windfalls that landowners receive from public infrastructure. This reduces the motivation for land speculation and land hoarding. Reducing the speculative demand for land can help keep land prices more affordable. It can also mitigate both the peaks and valleys in real estate prices associated with typical boom-and-bust cycles fueled by speculation. (Pittsburgh shifted its property taxes off of building values and onto land values in 1913. Pittsburgh experienced a much smaller decline in land values than other large cities during the real estate crash that preceded the Great Depression of the 1930s, indicating that this technique successfully reduced speculation-induced land price inflation.)<sup>37</sup>

Additionally, public service access fees on high-value sites can provide a motivation to develop these sites in line with market demand (derived from the underlying economy and tempered by existing zoning and other development regulations). Where market demand for development is high and zoning permits intense development, land values will be high, and the public service access fee will also be high. Because a landowner cannot avoid this fee (unlike a tax or fee on building values which could be avoided by not constructing or improving buildings or by allowing existing buildings to deteriorate), a landowner is motivated to find a source of revenue from which to pay the access fee. Thus, a public service access fee motivates owners to develop high-value sites or to sell to others who will do so. Where market demand for development is low, land values will be low and the public service access fee will be low. Thus, there will be little economic pressure for premature development of low-value sites.

To understand how this works, imagine two different cities trying to fund a new transit station. Both cities want to “capture value” from the adjacent property owners who will benefit from the new transit station, but they employ different techniques.

- **City A** decides that a fee based on the size or value of adjacent buildings would be the best approach. After all, the bigger the building, the more rent will be collected and the more employees and customers will take advantage of the nearby transit station.
- **City B** decides that a public service access fee based on the value of the land would be the best approach because the value of the station will be reflected in nearby land values regardless of whether buildings are constructed or not.

### **City A – Development Fee**

A fee applied to the size or value of a building.

No building, no fee. Thus the fee becomes a cost of production.

Econ 101: Increase the cost of production → Less production & Higher prices.

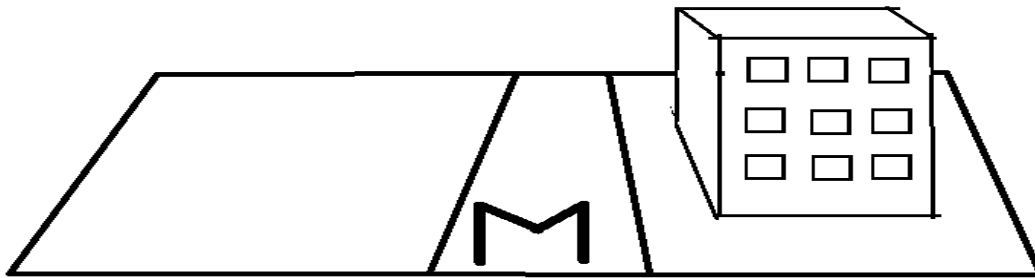
Does **City A** want to decrease the amount of commercial or residential space near the transit station and thereby increase the price of what’s left? (The “Development Fee” impact appears to be contrary to the goals of transit-oriented development.)

Property Owners in **City A**: Possible responses to avoid the development fee:

- Don’t build
  - Build less
  - Allow existing buildings to decline in value
  - Invest in construction in another location that does not have this fee.
  - Build and pass the fee on to future tenants / owners\*
- \* This is only possible because others will build less than they otherwise would, thereby reducing supply and causing the price for built space to rise.

A Development Fee appropriates privately-created value.  
It burdens future owners and tenants.

#### DEVELOPMENT FEE:



Fee = \$0

METRO

Fee = \$XXXX

#### City B – Public Service Access Fee

Fee levied on the value of nearby land, regardless of whether there are buildings.

Econ 101: A tax applied to something of fixed supply (land) does not reduce its quantity.

Therefore, assuming no change in demand, the total price paid by the consumer (price plus tax) will not change as a result of the fee. Therefore, the price of the land will fall.

Land is not produced. So how is its price determined?

People offer prices for land based on the expected benefits of ownership.

A tax or fee applied to land value is a cost of ownership (not a cost of production)

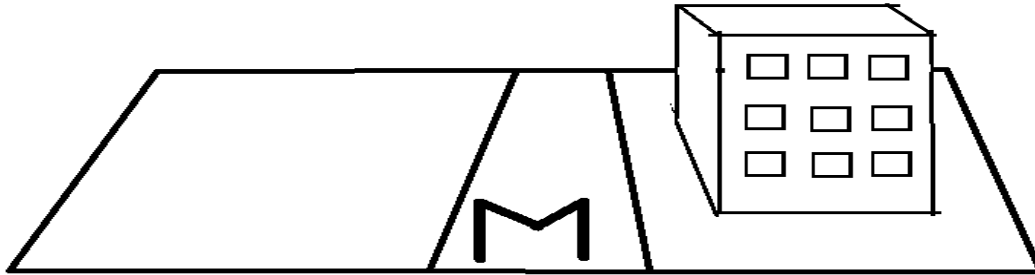
Increasing the cost of ownership → Lower Ownership Benefits & Lower Prices.

Property Owners in **City B**: Possible responses to avoid the fee:

- THERE IS NO ACTION LANDOWNERS CAN TAKE TO AVOID THIS FEE.
  - The value of the land is not controlled by the landowners.
  - The fee will be the same regardless of whether the owner builds or not.
- Because the fee cannot be avoided, landowners near the transit station in **City B** are more motivated to generate income from which to pay the fee. They will become more likely to develop the property, or sell to someone who will.

A public service access fee based on land value appropriates publicly-created value.  
It does not create any burden on private production or consumption.

### **PUBLIC SERVICE ACCESS FEE:**



Fee = \$XX

METRO

Fee = \$XX

As discussed earlier, economic windfalls from public services can encourage land speculation. This inflates the price of land and drives development away from high-value sites near infrastructure. Public service access fees, however, discourage speculation and can create an economic imperative to develop high-value sites. High-value sites tend to be infill sites near existing urban infrastructure amenities (like transit) and are exactly the places where development should go to realize the benefits of existing infrastructure investments and avoid the environmental and economic harms associated with sprawl.<sup>38</sup>

### **USER FEES AND ACCESS FEES – EXISTING AND POTENTIAL FEES FOR DC INFRASTRUCTURE**

The user-fee concept has a long history with some types of infrastructure systems. Early in our country's history, private road builders charged tolls to users. Private providers of buses, planes, trains and boats charged riders a fare. When the interstate highway system was being devised, tolls were considered as a potential source of funding. However, the expense and inconvenience associated with the collection of tolls was a major impediment. Another concern was that there would not be enough traffic (toll revenue) to pay for interstate highways in the sparsely populated western states. Therefore, a tax on motor vehicle fuel (the "gas tax") was imposed as a proxy for tolls. After all, the more a person drove, the more fuel would be used and taxes would be paid in proportion to fuel use which would be in proportion to travel. And, because each seller of motor vehicle fuels would have a record of how much fuel was sold, it would be relatively easy to collect the tax from fuel suppliers. (Suppliers would simply pass the tax along to consumers.)

### Motor Fuels Tax

The federal motor fuels tax has some disadvantages. Unlike a sales tax, that is typically a percentage of the sales price, the federal motor fuels tax is a per gallon fee (as are most state fuel taxes). Thus, as general inflation causes the cost of roadway repair and gasoline to escalate, gas tax revenues per gallon of fuel sold remain constant and lose value. And, as car engines are improved to get better gas mileage, they travel farther while using less fuel (and paying lower taxes). As alternatives fuels (including electricity) become more popular, some motorists might drive on roadways without paying any motor fuel tax. And, drivers who travel the same distance will pay different amounts depending on their engine's fuel efficiency and fuel type. Thus, motor fuel taxes are becoming less adequate (in terms of the amount of revenue raised) and less equitable (treating people differently whose use of public transportation infrastructure is identical).<sup>39</sup>

### Mileage-Based User Fees

New and improving technologies now make it possible to collect mileage-based user fees (MBUFs) from drivers without the inconvenience of toll plazas where motorists must stop to pay a toll. Electronically-collected MBUFs can impose charges on drivers that are related both to the distance that they travel and to the congestion costs that they impose upon others. Not only can such a system raise revenues, but it can raise them more equitably.

Of equal importance, pricing roadway use by distance and congestion can have beneficial impacts. People wanting to reduce expenses will be motivated to locate homes and businesses closer to the activities that they engage in on a regular basis. They will also be motivated to use less-congested roads or travel at less-congested times. Where roadway pricing has been used, this "demand-management" effect of pricing has significantly reduced congestion and improved the efficiency of the transportation network without requiring wider roads.

In Stockholm, relatively modest charges between 87p and £1.74 reduced traffic by more than 20%.<sup>40</sup> In London, traffic subject to the charge was reduced by more than 30%.<sup>41</sup> In turn, this has reduced bus transit journey times by 15% and increased bus speeds by 20% within the priced area while reducing excess waiting times due to service irregularity by 30% and reducing bus service disruptions due to traffic delays by 60%.<sup>42</sup>

Although the technology exists for collecting mileage- and congestion-based roadway fees, there are a number of factors that complicate near-term implementation. These include:

- Habituation of the public to "free" roads. Although the motor fuels tax compels most drivers to pay a road-related charge, even when idling in their own privately funded driveway, the motor fuels tax is only collected when refueling. Furthermore, because the tax is hidden in the price per gallon, most people don't know how much they are paying in motor fuel tax. Most members of the public incorrectly assume that they are paying high gas taxes (because the price of gas is high) and they also perceive it to be "free" to drive on most roads.<sup>43</sup>

- Fees that charge drivers according to the real-time congestion of particular roadways will raise concerns that there could be an invasion of drivers' privacy.<sup>44</sup>
- The federal motor fuels tax is collected from a few large fuel suppliers (and then passed on to consumers through the fuel price). This makes collection very simple and efficient. Mileage- and congestion-based fees must be collected from individual drivers. This requires adoption of an entirely new collection technology and administrative apparatus.
- Implementing MBUFs on a single road or bridge can also create problems. If there exists a parallel road or bridge without a toll, many drivers will divert from a tolled facility to a free one. This could lead to worse congestion and fail to achieve the benefits associated with MBUFs. To be effective, MBUFs must be implemented as part of a roadway network and care must be taken in system design and implementation to avoid traffic diversion.
- Implementing MBUFs on all existing lanes of a priced-roadway network is more effective (and economical) than creating new priced lanes while leaving existing lanes unpriced. However, in 2012 when Congress enacted the latest surface transportation authorization bill, Congress prohibited any reduction in the number of toll-free lanes on federal-aid highways.<sup>45</sup>
- Even though MBUFs are not taxes on non-resident income – and therefore compliant with the District's Home Rule Charter – Congressional representatives from suburban jurisdictions might perceive MBUFs as disadvantageous for their suburban constituents who drive into the District. Therefore, they might be inclined to use their power over District affairs to thwart attempts by the District to implement MBUFs.
- Related to the above, implementation of MBUFs in the District must be carefully coordinated with their implementation in the surrounding jurisdictions. Implementing a new tax or fee (absent a reduction in an existing tax or fee) creates a competitive disadvantage for the jurisdiction that implements it. On the other hand, if the surrounding jurisdictions implement MBUFs, the high volume of traffic on District roadways should allow the District to charge a lower rate per mile than surrounding jurisdictions to raise comparable revenues. District MBUFs with lower rates per mile (except perhaps during rush hour) should allow the District to be economically competitive with suburban jurisdictions in this regard.

Regarding access fees, WMATA is already fairly aggressive in charging market-rate joint development and station connection fees in those instances where it controls land or air rights adjacent to Metrorail stations. The limitation here is that WMATA controls such a small percentage of the total land area that benefits from proximity to Metrorail stations.

We know that Congress obtained 50% of the cost of first-time street paving from adjacent landowners in the late 1800s and early 1900s. When the District constructed the New York Avenue Metrorail Station in Northeast Washington, it obtained approximately 30% of the cost of the station from nearby landowners.<sup>46</sup>

There is evidence, however, that the District could have obtained a greater return. In 1995, the pension fund that owned an obsolete railroad yard south of National Airport sought development rights for several hundred acres from Arlington and Alexandria. Permits were denied because of the traffic congestion on Route 1 during rush hours – the only available road for auto access to the site. However, permitting authorities noted that a Metrorail line ran through the property. If a transit station was provided, they would reconsider. The pension fund did the math and offered to pay 100% of the cost of a new Metrorail station at that location.<sup>47</sup>

Was the private sector proposal to pay 100% of the cost of a new transit station a result of unique circumstances – or could it be replicated for other infrastructure projects? The ability of a single landowner to internalize most of the positive externalities associated with a new rail station at this location is a unique situation. More typically, there are multiple landowners surrounding a proposed rail station or other public works project. But multiple land ownership does not negate the proposition that public works can create enough value to be self-financing. Instead, multiple land ownership complicates the arrangements by which this value gets collected. But coordinating the collection of land value from multiple landowners is a role that most municipal governments are capable of fulfilling.

Today, the District imposes an infrastructure access fee through the tax on land values that is embedded in the existing property tax. However, for every \$100 of land value created by public goods and services, the District collects at most only up to \$1.85 per year. Depending upon the capitalization rate used, these payments have a present value of only \$20 to \$40. In other words, at the highest property tax rate being charged, the District is giving away over 60% of the land value that it creates.

#### Value Capture versus Value Transfer versus Revenue Segregation

In recent years, a more common term for “public service access fee” has been “value capture.”

#### Definitions:

“Value capture” is the process of receiving value in exchange for producing something of value.

- If I build a house for Paul and collect money from Peter, I might be able to recoup my costs. However, this is NOT value capture. (This could be called “value transfer” or “robbing Peter to pay Paul.”)
- If I build a house for Paul and collect money from Paul according to the length of his trousers, I might be able to recoup my costs. However, this is NOT value capture. (It is merely an arbitrary form of cost recovery that will cause “shorts” to become more fashionable.)
- If I build a house for Paul and collect money from Paul based on the value of the house, this IS value capture because there is a NEXUS between value produced and value received.

It is the ability of prices to transmit information about values between producers and consumers that informs decisions about what is produced, what is consumed, and how resources are allocated in that process. This is what makes value capture a powerful tool regarding the demand for and supply of public infrastructure.

Unfortunately, the term “value capture” has become something of a fad among consultants, some of whom don’t fully understand the concept. In the transit arena, almost any revenue source, other than fares, has been labeled as “value capture.” Thus, a number of funding techniques have become associated with value capture even though they don’t accomplish its primary goal of establishing a nexus between the receipt of public benefits and payment for those benefits. This creates confusion.

So-called “value capture” techniques Include:

<u>TECHNIQUE NAME</u>	<u>STATUS AS VALUE CAPTURE</u>
<input type="checkbox"/> Land Value / Site Value Fee	YES
<input type="checkbox"/> Special (or Benefit) Assessment District	Maybe
<input type="checkbox"/> Joint Development / Transit Connection Fees	YES
<input type="checkbox"/> Betterment Levies	YES
<input type="checkbox"/> Exactions	NO
<input type="checkbox"/> Development Impact / Transportation Utility Fee	NO
<input type="checkbox"/> Tax Increment Financing (TIF)	NO
<input type="checkbox"/> Land Sale / Lease	YES

### **Land Value or Site Value Fee**

This is an annual charge based on the value of unimproved land. As mentioned above, land value represents a capitalization of the value of all combined public goods and services available at a particular location. Therefore, a fee based upon this value is definitely “value capture.”

A land value fee is already collected as part of the traditional property tax. However, for every \$100 of publicly-created land value, the owner must only return between 1% and 2% annually. The present value of such a payment stream is between \$10 and \$40. Thus, landowners are receiving substantial windfalls from publicly-created land values. On the other side of the coin, many cities that are facing “revenue shortfalls” are nonetheless giving away 60% to 90% of the land value that they create through the provision of public goods and services.

### **Special (or Benefit) Assessment District**

This is a special payment in addition to the typical property tax required of all property owners. Typically, it is required where owners within a defined geographic area have received the benefit of some special infrastructure improvement that is not available to property owners generally. Whether a special assessment constitutes “value capture” depends upon the basis



for the assessment. If the assessment is based upon land value, it constitutes “value capture.” If the assessment is based upon building value, it constitutes “value transfer.”

### **Joint Development / Transit Connection Fees**

A joint development fee is a price paid by a developer to develop public land or air rights. A “connection fee” is a price paid by a developer or property owner to create or maintain a direct connection to a transit facility. (“Direct connection” means that people can access a transit facility from private property without first going into public right-of-way. Examples include, but are not limited to, two entrances from private property to Metrorail at Farragut North, two of the Metrorail entrances at Union Station, two entrances at Metro Center, one from Macy’s and another from 1001 G Street, NW, and an entrance at Farragut West from the International Square property.) If the market value of these development or connection rights is charged to the beneficiary, then these fees constitute “value capture.”

### **Betterment Levies**

These are one-time fees intended to capture a portion of the land value increment created by an infrastructure project. Therefore, betterment levies qualify as “value capture.”

Although calculating the total land value of a property can be readily accomplished with modern assessment techniques and technology, calculating the portion of land value created by a discrete infrastructure project is difficult. In recognition of this difficulty and uncertainty, betterment levies typically attempt to capture only a fraction of the estimated land value increment.

This measurement difficulty is reflected in some studies noting that land values near a new rail station increased only slightly after transit service began. While each project is unique, and some transit projects create more land value than others, there might be a systemic methodological error in how some of these studies are measuring the land value increment. What some of these studies miss is that the mere announcement of a feasibility study for a transit station can cause land values to rise. That increase may accelerate if and when funds are committed and construction begins. In other words, the lion’s share of land value increase created by a new transit station might be realized before transit service begins. This pattern of land value increase was observed around the New York Avenue Metrorail station in Washington, DC.<sup>48</sup>

Also, land values rise for multiple reasons. Attempting to assign all or part of a land value increase to a particular infrastructure project can be difficult. Because most infrastructure facilities are long-lasting, they create value year-after-year. Estimating the present value of new infrastructure before the market has had an opportunity to respond to it complicates this process further. In light of this uncertainty and the on-going value of infrastructure, betterment levies are politically contentious, prone to litigation, and often abandoned for being more trouble than they are worth.<sup>49</sup>

## **Exactions**

Exactions are one-time, in-kind contributions to public infrastructure negotiated with a developer as part of an agreement to grant a development permit. For example, a developer may be required to provide an elementary school to service a new subdivision and/or to create a turn lane and signalized intersection where access to the subdivision meets the closest arterial roadway. Exactions represent an effort to avoid having new development generate a demand for additional public goods and services which are paid for by existing taxpayers. By shifting these costs back onto the developer (and the occupants of the new development) exactions represent “cost avoidance” but not “value capture.”

## **Development Impact Fees**

Impact fees are often associated with “adequate public facilities ordinances.” They mandate that private development likely to require an increase in public services, must compensate the public for that increase in service level. They are similar to exactions except that exactions are generally in-kind provisions of infrastructure that are negotiated whereas impact fees are typically cash payments made according to established regulatory provisions. Thus, impact fees represent “cost recovery” and not “value capture.”

Impact fees, which anticipate future increases in public spending associated with proposed private development, are the flipside of value capture. Value capture should be employed in urbanized areas to help ensure that existing public infrastructure is well-utilized and not squandered by speculators. Impact fees should be employed in suburban or rural areas to help ensure that developers, who take advantage of low suburban / rural land prices (low because of the relative lack of public services) and whose developments generate a demand for increases in public services do not then shift the cost of these service increases onto other taxpayers.

As a case in point, America On Line (AOL) outgrew its offices in Fairfax County, Virginia and sought a new headquarters in the DC region. Although AOL could have located anywhere, it chose to create a campus in rural Loudoun County. No doubt, cheap land was part of the draw. The land was cheap because it was relatively inaccessible and lacked public goods and services. After AOL moved into its new campus, its executives complained that the meager network of county roads was insufficient to effectively transport AOL’s employees to its new campus. AOL wanted the taxpayers of Loudoun County to improve the roads to its campus and thereby boost AOL’s land values at the taxpayers’ expense.

## **Tax Increment Financing – TIF** (as applied in most places and not as applied in the District)

Outside of the District, tax increment financing entails establishing a tax revenue benchmark for a geographically-defined area. It is assumed that this revenue will remain static “but for” the creation of a new development project. Any increase in tax revenues above the benchmark amount will be assumed to be the result of the new development and will be placed in a dedicated fund to pay off infrastructure investments associated with that new development project.

NOTE: The property owners within the designated TIF area do not pay higher taxes than they otherwise would in the absence of a TIF. However, instead of all tax revenues going into the general fund, TIF-area revenues exceeding the benchmark amount are set aside to finance infrastructure that will uniquely benefit the new development. Thus, a typical TIF is not “value capture.” Instead, it should be characterized as “revenue segregation.”

### **Land Lease / Sale**

If the lease or sale of public land is performed at full market value, then the sale or lease price should capture the value imparted to the site by nearby public goods and services at the time of the transaction. Thus this technique would constitute “value capture.”

It is often tempting for public entities to declare public land as “surplus” and then sell it to obtain a large (and quick) cash infusion. Such sales can be used to mask budget problems. They can also be subject to “sweetheart” deals whereby a favored party obtains public land for less than fair market value. The public and the press often lack the information and expertise to evaluate whether the sale of public land is accomplished at a fair price or not.

As a general rule, a long-term lease may be preferable to a sale. Instead of a large, one-time infusion of cash, the jurisdiction obtains a steady flow of income. If land values increase after the sale of public land, that increase accrues as a windfall to the new owner. However, under a long-term lease, the terms of the lease can be re-negotiated upon expiration, potentially allowing the public sector to benefit from future land value increases. Also of importance is the fact that, at the end of the lease, the land remains a public resource under public control.

## **PART I CONCLUSION**

### Taxes versus Fees:

- Taxes are compulsory payments made for the general provision of public goods and services. Typically, there is little relation, if any, between what taxes are paid and what public goods and services are received in return.
- Fees are charges related to taxpayers receiving a particular benefit from (or imposing a particular cost upon) the public sector.

### Advantages of Fees:

- The relationship between receiving a government benefit (or imposing a cost upon the government) and paying a fee in proportion to the benefit received or cost imposed:
  - Is easy to understand and is comprehensible;
  - Contains an intuitive degree of fairness and reasonableness; and
  - Allows people to adjust their behavior according to the level of benefits that they want to receive and according to the costs they are willing to pay.
- Helps meet the Commission’s goals regarding “fairness” and “transparency.”

- If a government can rely more upon fees than taxes, or if it can transform taxes to be more like fees, then government can create incentives for more responsible and efficient utilization of public goods & services.

#### Disadvantages of Fees

- While fees impose costs upon people and businesses that are proportional to the benefits that they receive or the costs that they impose (horizontal equity), fees are generally unrelated to “ability to pay” (vertical equity). Therefore, their incentive effects create the most economic pressure on people with the least resources. Dealing with this aspect of fees could take two different paths:
  - One approach would be to avoid fees, relying solely on “ability-to-pay” wealth or income taxes. As mentioned, this approach abandons the incentives associated with fees that help infrastructure systems operate more efficiently.
  - Another approach would be for income supplement & wealth redistribution programs to reduce inequality, leaving the fees in place to take advantage of their incentive effects. For example, food is recognized as a necessity of life. But, instead of eliminating food prices because of the hardship they impose upon low-income households, we provide food stamps and income supplements.
- Although many of us are proud of our market economy, we often find prices to be “coercive” if sudden price changes make existing customs, routines or habits more costly.
- Without objective, performance-based standards, setting fees can be subject to political pressures. If fees are too low or too high, they fail to accomplish their goal of promoting fair and efficient resource allocation.

## **PART II: RECOMMENDED INFRASTRUCTURE USER AND ACCESS FEES**

This section of the report recommends specific infrastructure user and access fees that can be implemented by the District Government.

### **USER FEES:**

#### **Pay As You Throw**

Today, solid waste collection is provided without additional charge to homeowners in exchange for what they pay in property taxes. (Tenants pay property taxes through their rents, but do not have access to District-provided solid waste disposal. So tenants pay an additional fee through their rents for private solid waste collection and disposal.) This financial arrangement provides no economic incentive to reduce the amount of waste disposed of or to recycle. “Pay As You Throw” solid waste collection regimes charge households a fee for solid waste collection based on either the volume or weight of waste disposed. This creates a financial incentive to reduce waste and to recycle. Pay As You Throw collection fees are implemented in over 7,000

cities and towns in the USA including Seattle Washington, Portland Oregon, San Francisco California, and Austin Texas.<sup>50</sup>

Pros:

- As mentioned above, the pros for this approach are primarily related to creating economic incentives to reduce or recycle solid waste. This makes the economy more efficient, conserves valuable resources and extends the useful life of existing landfills.
- It creates a more level playing field between people who reside in single-family homes (who get “free” trash collection from the District) and those who live in multi-family dwellings who must pay extra for this. (Some years ago, condominium owners arranged to get a “trash collection credit” applied against their DC income taxes to create more parity between them and owners of single-family homes. However, there is no parity for people living in rental apartments who pay property taxes and then pay extra for trash collection.)

Cons:

- The primary problem is political. Trash collection, included in the property tax of many homeowners, appears to be a “free” service. The institution of a monthly or annual collection fee will meet resistance.
- This system does not necessarily create incentives for reducing or recycling waste in multi-family buildings.

### **Clean Rivers Impervious Area Charge**

When rain water falls onto vegetated soils, it sinks into the ground. When rain water falls onto impervious surfaces (roofs, driveways, sidewalks, streets, etc.), water quickly rushes into storm drains. In many parts of the District, the storm drains and sanitary sewers are combined. This is good to the extent that storm water runoff from streets is heavily polluted and therefore treatment of storm water at the Blue Plains Sewage Treatment Plant is important to avoid having storm water contaminate the Potomac and Anacostia Rivers. On the other hand, rain fall in excess of one inch produces so much storm water runoff that it overwhelms the capacity of the sewage pipes. This prompts “combined sewer overflows” (CSOs) whereby a combination of storm water and raw sewage is dumped directly into rivers and streams. In the case of the Bloomingdale neighborhood, significant rain events have resulted in the flooding of their streets and homes with raw sewage.

DC Water is under a federal legal mandate to dramatically reduce CSOs. To accomplish this, DC Water is digging huge tunnels that will serve as CSO reservoirs, holding the sewage overflows until the rain event has ended and then slowly metering the sewage back into the regular piping system for treatment at Blue Plains. The cost for constructing these tunnels is estimated at about \$2.6 billion.<sup>51</sup>

In order to fairly apportion the costs of this project, DC Water has begun to charge property owners according to the amount of impervious surface area on their property. Thus, the impervious surface charge is a user fee that compensates the public for treating storm water runoff.

Such a user fee would appear to provide a financial incentive for property owners to reduce or eliminate storm water runoff from their property, thereby improving water quality while simultaneously minimizing the amount of tunneling that will be required to store excess storm water runoff. However, this aspect of the fee has not yet been worked out. The District Department of Environment is reviewing a system of fee reductions that could be instituted if property owners installed mitigation measures such as rain gardens, rain barrels and green roofs. But this aspect of the storm water fee is still in the planning stage.

Pros:

- Incentives for property owners to reduce and/or mitigate storm water runoff.
- Owners of property in the District are not necessarily residents of the District, so the fee spreads these costs to non-residents whose actions necessitate the improvement of storm water infrastructure.

Cons:

- The fee has been implemented without the offsets for storm water runoff mitigation.

**Performance-based Parking Pricing.**

DDOT began a few pilots to have parking meters charge prices based on supply and demand. These pilots were initially located in the following locations:

- New baseball stadium and Barrack's Row;
- Columbia Heights; and
- H Street, NE

The principle is that parking prices should be set so that curbside occupancy ranges between 80% and 90%. This objective standard helps transportation officials establish appropriate parking prices. In areas of low parking demand, this could reduce parking prices. In areas of high demand, this could increase parking prices.

Pros:

- The curbside parking resource is well-utilized.
- People arriving at a destination by auto can quickly find a parking space without excessive "cruising."
- Traffic congestion can be reduced while access to downtown activities (by all modes) can be increased.
- An appropriate source of funds for transit services.

Cons:

- Many people have an aversion to paying for parking
- Systems must be established to determine curbside occupancy and to adjust rates accordingly.
- People without computers or “smart phone” apps may not be aware of parking prices until they reach their destination. (Although, in some cases, they will be more likely to find an available space.)

The Council has recently enacted legislation allowing DDOT to expand the use of performance-based parking throughout the District.<sup>52</sup>

**Clean Air Compliance Fee**

The public transit network in the Washington region is fairly robust. Most people are within walking distance of bus transit which can take them to their destination or to a Metrorail Station. Yet many people do not avail themselves of transit. According to surveys performed by the Metropolitan Washington Council of Governments, where employees have free parking at work, 82% of employees drive alone to work and only 7% use transit. However, where employee parking is not free, only 45% drive alone to work and 39% use transit.<sup>53</sup>

In the District of Columbia, people who park in commercial parking lots pay a parking sales tax that helps finance public transit. Transit services help mitigate congestion and air pollution caused by automobile traffic. However, many employees receive free parking at work -- and thus make no payment to mitigate the air pollution or congestion that they cause. The Clean Air Compliance Fee Act of 1995 (CACFA) was enacted to place a fee on the provision of free employment parking. The fee was roughly equivalent to what a driver would pay in parking sales tax had they parked at a commercial parking lot at the typical downtown rate.

Although enacted by the Council and signed by the Mayor, suburban members of Congress were concerned about the impact of this law on themselves and their constituents. They thwarted implementation.<sup>54</sup> Then, as part of the National Capital Revitalization and Self-Government Improvement Act of 1997, which responded to a District Government financial crisis, Congress repealed CACFA. The DC Tax Revision Commission could urge the Council to re-enact this measure. (Draft legislation is attached to this report in Appendix 1.)

Pros:

- The payment of such a fee would continue to be substantially less than what commuters would pay at a commercial parking lot.
- People using free employment parking spaces contribute to traffic congestion and pollution. Through the Clean Air Compliance Fee, these drivers would be required to contribute toward the mitigation of congestion and pollution as do others who park where parking fees are privately collected.

- By requiring this payment, “free employment parking” would no longer be “free.” This would induce some drivers to change behavior by driving less – either by switching to transit, to carpools or to some other mode of transportation.

Cons:

- Suburban auto commuters and their Congressional representatives may want to interfere in the District’s legislative process.
- The federal government might litigate this law’s applicability to federal agencies. (The federal Clean Air Act contains a waiver of sovereign immunity and requires all three branches of the federal government to comply with state and local clean air provisions in the same manner and to the same extent as anyone else. The federal government has litigated clean air fees in the past, but not successfully.)

## **PUBLIC SERVICE ACCESS FEES**

### **Re-Orienting the District’s Property Tax To Become a Public Service Access Fee**

Earlier, this report looked at two different approaches to paying for transit infrastructure. City A employed a “Development Fee.” City B employed a “Public Service Access Fee.” The traditional property tax is actually a combination of these two funding approaches. It taxes both the value of buildings and the value of land. In keeping with the concepts previously discussed, the District could re-orient the property tax to become a public service access fee by reducing the property tax rate on building values and increasing the property tax rate on land values.

Pros:

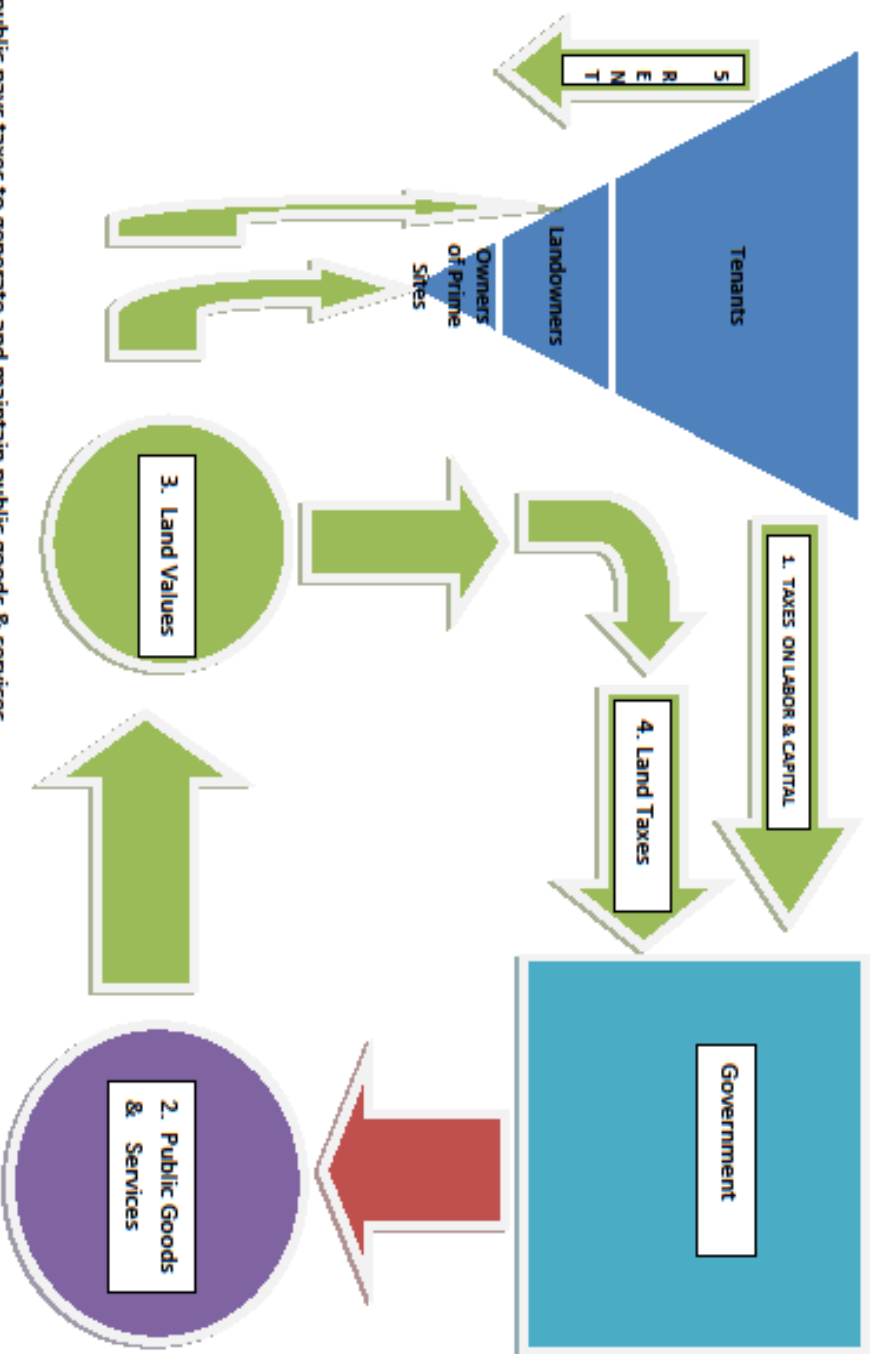
1. The lower tax rate on building values would make it cheaper to construct, improve and maintain buildings. More affordable buildings would be beneficial to residents and businesses alike.
2. The lower cost of building improvements would spur additional investments in property maintenance and improvements (such as weatherization and energy conservation) where these improvements are now marginally unprofitable due to the additional tax that they would incur. This activity would generate jobs.
  - a. The District’s property tax rate applied to building values is between 1% and 2%. This might not seem like much of a burden. However, unlike a sales tax that is paid only once (at the time of purchase), a property tax on improvements is paid each and every year that an improvement adds value to a property. A net present value calculation reveals that the economic impact of this stream of payments is equivalent to a one-time sales tax of between 10% and 20% on building construction materials and labor.



- b. If someone were to propose such a sales tax, they would be shouted down for endangering jobs, businesses and affordable housing. But, without realizing it, the property tax applied to building values is having this very impact. Not surprisingly, it discourages the maintenance and improvement of existing structures.
- 3. The higher cost of land ownership would discourage land speculation and motivate infill development of vacant and underutilized land. This also would generate jobs. Furthermore, it would help convert vacant and boarded up properties (which harbor criminals and arsonists and which drain city coffers for police and fire responses) into neighborhood assets, thereby reducing District costs and increasing revenues from the new activities occurring in redeveloped properties.

The following graphic shows how the use of value capture to transform the property tax into a public service access fee increases the extent to which public goods and services can become financially self-sustaining while simultaneously reducing general tax payments by the public and also reducing private land rent payments required to access public goods and services.  
(Compare this graphic to the one on page 17.)

## RECYCLING LAND VALUES FOR SUSTAINABILITY & EQUITY



1. General public pays taxes to generate and maintain public goods & services.
  - a. Owners of prime sites contribute less than others because most of their taxes are passed through to tenants and customers.
  - b. Taxes on labor and capital can be reduced as a result of recycling publicly-created land values. (See step 4)
2. Governments use taxes to produce public goods & services
3. Benefits of many public goods & services are capitalized into higher land values ("Location, location, location!")
4. Publicly-created land values are returned to the public by reducing taxes on buildings & increasing taxes on land values.
5. Reduced windfalls to private landowners reduce land prices and reduce land rents from tenants to landowners. Reduced taxes on buildings make buildings more affordable, so tenants get more value for the building rents that they pay.

Thus, a mix of infrastructure user fees and access fees can obtain infrastructure funding from those who benefit, in proportion to the benefits provided to them or in proportion to the costs they impose on others (e.g., congestion). Increasing reliance on user and access fees related to publicly-created land values could allow for a reduction in taxes on privately-created building values, equipment and income. Such a revenue structure would be perceived by most people to be:

1. Fair (horizontal equity);
2. Comprehensible; and
3. Transparent.

By reducing taxes on productive activities and by inhibiting land speculation (and thereby keeping land prices in check), this revenue structure could also promote job retention and creation while enhancing the District's economic competitiveness with other jurisdictions.

**Cons:**

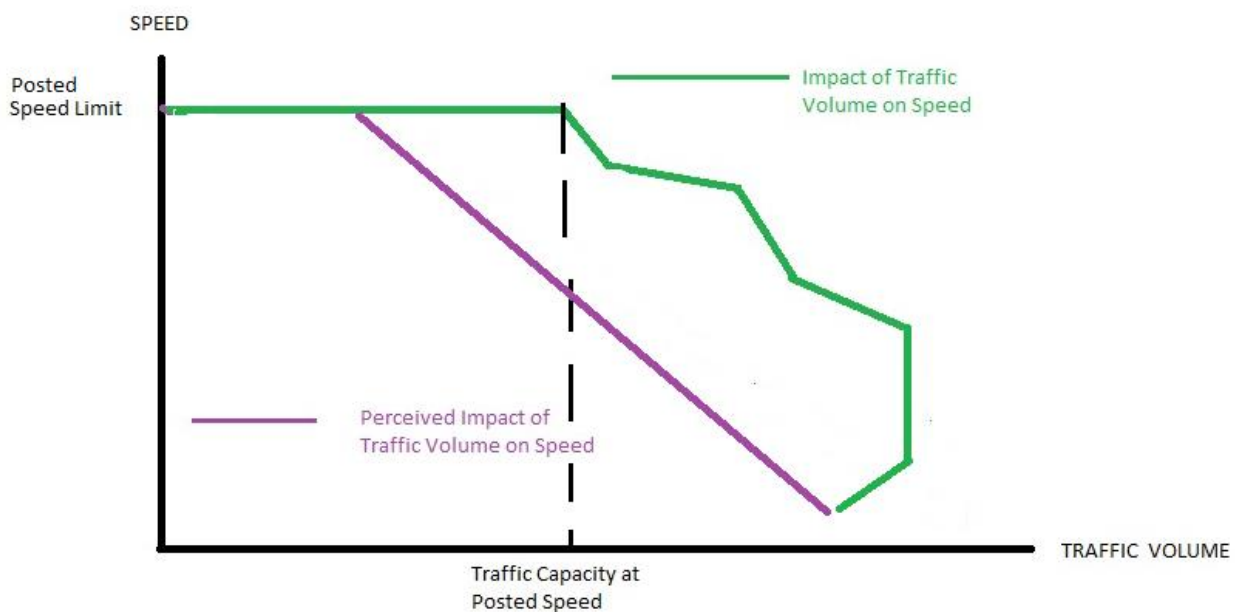
- The benefits of this approach are not understood by most people and an extensive public outreach, education and involvement effort could be required.
- Real estate speculators would mobilize in opposition.
- The District would need to pay greater attention to the separate assessment of land and buildings. The District would also need to allow property owners to appeal the apportionment of property value between land and buildings even if they do not dispute the total assessment.
- Care would be required in implementation to avoid creating windfalls or wipeouts. (A phase-in approach has been used successfully in other jurisdictions to address this concern.)

## NOTES

1. Roy P. Basler, The Collected Works of Abraham Lincoln, vol. 2, p. 221.
2. Online Compact Oxford English Dictionary, <http://oxforddictionaries.com/definition/english/infrastructure> (accessed May, 2013)
3. US General Accounting Office, "District Government: Information on Its Fiscal Condition and the Authority's First Year of Operations," (GAO-96-133) July 19, 1996. Statement of Gregory M. Holloway, Director, Government-wide Audits, Accounting and Information Management Division, at page 11.
4. MWCOG. As part of its Regional Mobility and Accessibility Study, MWCOG identified at least 200,000 households between now and 2030 that will live outside of the Metropolitan Region but that will nonetheless send at least one worker into the Region for regular employment.
5. Walter Smith & James Banner, "The Case for a Commuter Tax," The Washington Post, July 27, 2003.
6. D.C. Code § 1-206.02(5) (2013). More detail on this topic has already been provided in other presentations already made to the Commission.
7. GAO, "District of Columbia Structural Imbalance & Management Issues," May 2003.
8. Ibid.
9. Estimates for future population and employment have been presented in other presentations to the Commission. In particular, see presentations by Wallace and Fuller.
10. In other words, only 20% of trips are from home to work and back again. The other 80% of trips would be for education, shopping, recreation, business trips during the workday, etc.
11. National Capital Region Transportation Planning Board, Household Travel Survey 2007-2008. Cited in the TPB Bicycle and Pedestrian Plan, 2010, p. 12.
12. National Capital Region Transportation Planning Board, Bicycle and Pedestrian Plan, 2010, p. i-3.

13. Tom Fairchild, Director, Mobility Lab: “Arlington Focuses on Moving People, Not Cars, in the Nation’s Worst Traffic Metro Area,” February 5, 2013. “Despite huge growth over the last 20 years, Arlington traffic counts on major arterials have amazingly . . . gone down.” See <http://mobilitylab.org/2013/02/05/arlington-focuses-on-moving-people-not-cars-in-the-nations-worst-traffic-metro-area/>
14. Persons in regional activity centers take fewer trips, shorter trips and more trips by walking & transit than the regional average. See “2007/2008 Household Travel Survey: Major Findings for Regional Activity Centers / Clusters,” May 20, 2009. <http://www.mwcog.org/uploads/committee-documents/bV5cVI9b20090520152622.pdf>
15. This characterization is an observation by the author. Funding for the maintenance, rehabilitation or replacement of existing urban infrastructure did not appear to be high on the federal agenda, with the possible exception of tearing down neighborhoods for urban renewal and/or building urban segments of interstate highways.
16. A possible exception would be the high cost of police, fire and emergency medical services to respond to roadway crashes. But these expenses have never been explicitly tied to the cost of driving, and therefore remain invisible to most people. In fact, few Americans understand that between 30,000 and 40,000 people die in auto crashes annually – with many more injured and with considerable property damage as well.
17. Even the gas tax, which is related to how much we drive, is hidden within the total price of gasoline. Furthermore, gas taxes do not cover many roadway-related expenses such as pot-hole repair, emergency response to crashes or the mitigation of air and water pollution caused by roadways and traffic. And, because we don’t pay for gas each time we drive, individual auto trips often appear to be free of cost to most drivers.
18. Brian Taylor, Rebecca Kalauska & Hiroyuki Iseki, “Addressing Equity Challenges to Implementing Road Pricing,” Institute of Transportation Studies, UC Berkeley, 2010. “By disconnecting the consumption of transportation capacity from the prices paid for travel, non-transportation-based finance instruments -- like sales taxes and general obligation bonds -- discourage travelers from considering how their travel choices impose costs on society (through congestion delays, noise, emissions and so on).”
19. Donald Shoup, *The High Cost of Free Parking*, Planners Press, 2005, [www.planning.org](http://www.planning.org).
20. Rick Rybeck, “Using Value Capture to Finance Infrastructure and Encourage Compact Development,” *Public Works Management and Policy Journal* (Sage) Vol. 8 No.4, April, 2004, pp 249-260. <https://www.mwcog.org/uploads/committee-documents/k15fVI1f20080424150651.pdf>.

21. Todd Litman, “Understanding Smart Growth Savings: What We Know About Public Infrastructure And Service Cost Savings, And How They Are Misrepresented By Critics” by Todd Litman, Victoria Transport Institute, April 25, 2013.  
[http://www.vtpi.org/sg\\_save.pdf](http://www.vtpi.org/sg_save.pdf) See also, Transportation Research Board, Transit Cooperative Research Program (TCRP) Report 74: *Costs of Sprawl*, 2000. See also, Real Estate Research Corporation, *The Costs of Sprawl*, 1974. These reports show that sprawl can increase the cost of infrastructure by between 10% and 40%. See also Building Livable Communities, Clinton-Gore Administration, 2000; Burchell, Robert, et al., *Costs of Sprawl—Revisited*, Transit Cooperative Research Program, Federal Transportation Administration, 1997. Compact development also leads to substantial energy savings for both buildings and transportation. See Jonathan Rose Companies for the U.S. Environmental Protection Agency, “*Location Efficiency and Housing Type—Boiling it Down to BTUs*,” (2011), at [www.epa.gov/smartgrowth/pdf/location\\_efficiency\\_BTU.pdf](http://www.epa.gov/smartgrowth/pdf/location_efficiency_BTU.pdf).
22. John Walker, “*The Acceptability of Road Pricing*,” (London: RAC Foundation, 2011), p 9 and FHWA Brochure 1999, Federal Highway Administration, “Value Pricing Pilot Program.” Brochure. U.S. Department of Transportation, Washington, DC (1999) <http://www.fhwa.dot.gov/policy/vppp.htm>. The non-linear relationship between traffic volume and traffic congestion is shown below. Although many people may assume that speed declines proportionately to increases in traffic volume (purple line) the reality is that speed declines precipitously with the addition of relatively few vehicles when a roadway segment reaches its carrying capacity at any given speed (green line).



[Relation of Traffic Volume to Speed – illustrated by Rick Rybeck]

The conclusion to be drawn is that a relatively small reduction in traffic volume on a congested road can lead to significant reductions in congestion.

23. Rick Rybeck, "Public Acceptability of Road-Use Pricing: A Literature Review," Brookings, April 2012.  
<http://www.mwcog.org/transportation/activities/congestionpricing/materials/Appendices/Road-Use%20Pricing%20Literature%20Review-Just%20Economics.pdf> .
24. See WMATA's web site at <http://www.wmata.com/rail/parking/> .
25. Eric M. Weiss, "Drivers Feeling Shunned by D.C.: City Less Welcoming to Suburban Cars" The Washington Post, July 6, 2008, p A 01 citing MWCOG.
26. Robert Griffiths, MWCOG Staff, memo to DDOT, May 12, 2006.
27. DC Code, 2001 Ed. 9-401.04 through 9-421.13
28. Christopher Leinberger, "Here Comes the Neighborhood," *The Atlantic*, June 2010.  
<http://www.theatlantic.com/magazine/archive/2010/06/here-comes-the-neighborhood/308093/> .
29. Rick Rybeck 2004, op. cit., pp 254-255.
30. Walter Rybeck, Re-Solving the Economic Puzzle, Shephard-Walwyn, 2011, pp164-165.
31. I am defining "public service access fee" as a fee to collect the on-going value conferred upon a parcel of land due to the parcel's proximity to public goods and services. This is to be distinguished from a "connection fee" which is typically a one-time charge for making a physical connection between the public utility pipes or wires in public space at a property's boundary and the private pipes or wires within that property that serve the site.
32. In the case of a sewage fee, I am paying to avoid harming others through the disposal of my waste. This fee internalizes the negative externalities that would be associated with dumping my raw sewage into a nearby stream or river.
33. Rick Rybeck 2004, op. cit. p252
34. The case could be made that Tysons Corner, Virginia has attracted firms that wanted to locate on K Street in the District, but which could not afford K Street prices. Eventually, Tysons Corner became so infused with such firms, that Tysons Corner became a first choice rather than a second choice among many of these types of firms.

35. Rick Rybeck and Walter Rybeck, "Break the Boom and Bust Cycle," *PM Magazine*, ICMA, August, 2012, pp 6-10.  
<http://webapps.icma.org/pm/9407/public/cover.cfm?author=Rick%20Rybeck%20and%20Walt%20Rybeck&title=Break%20the%20Boom%20and%20Bust%20Cycle&subtitle=> .
36. Ibid., p 8, citing James A Kushner, "Affordable Housing as Infrastructure in the Time of Global Warming," *The Urban Lawyer*, Vol. 42 No.4 / Vol. 43 No. 1, Fall 2010 Winter 2011, p 207 crediting real estate speculation as a significant cause of the 2007 economic melt-down.
37. Prior to the Great Depression, there was a nationwide real estate boom and bust. Not surprisingly, land values in major U.S. cities declined drastically. Between 1930 and 1940, land values declined in New York, 21 percent; Milwaukee, 25 percent; Cincinnati, 26 percent; New Orleans, 27 percent; Cleveland, 46 percent; Los Angeles, 50 percent, and Detroit, 58 percent. But Pittsburgh implemented a two-rate property tax in 1914. As evidence that this reform reduces speculation, Pittsburgh's decline in total land values was only 11 percent between 1930 and 1940. Percy R. Williams (Pittsburgh's Chief Assessor, 1934–1942), "Pittsburgh's Pioneering in Scientific Taxation," fn. 59. Republished as *The Pittsburgh Graded Tax Plan: Its History and Experience*, Robert Schalkenbach Foundation, New York, 1963.  
<http://savingcommunities.org/docs/williams.percy/gradedtax.html>. See also: "Why Pittsburgh Real Estate Never Crashes: The tax reform that stabilized a city's economy." Dan Sullivan at <http://savingcommunities.org/places/us/pa/al/pgh/nevercrashes.html>. ]
38. DiMasi, J., "The Effects of Site Value Taxation in an Urban Area: A General Equilibrium Computational Approach," *National Tax Journal*, (1987, December) 40, 577-590. This econometric study showed that transforming the traditional property tax into a tax on land values would shrink the extent of an urbanized area, causing it to become more compact. The model assumed that all landowners maximize present income by renting to the highest paying user. In reality, however, cities contain vacant and underutilized land. Therefore, this reform could have a more robust impact than the model indicated.
39. As part of the District's FY 2014 Budget proposal recently enacted by the Council, the District's 23.5-cent per gallon gas tax is to be replaced by an 8.3% sales tax on wholesale purchases of fuel. This proposed change – subject to Congressional enactment of the District's budget as proposed – has no bearing on the thrust of this paper that motor fuel taxes are too invisible from drivers and too unrelated to driving behavior to constitute an effective user fee.
40. John Walker, *"The Acceptability of Road Pricing,"* (London: RAC Foundation, 2011), p. x and p. 60.



41. Ibid., p 40.
42. Jeffrey Ensor (USDOT) memo to Nancy Ody, "Benefits to Bus Transit from London Congestion Charging Scheme," June 23, 2004.
43. Beth McGinn, "Are Good Roads and Transit Worth As Much To You As Household Electricity Or Cable Service?" ARTBA, May 28, 2013. According to FHWA, the average family pays about \$46 per month in gas taxes. [http://www.artba.org/article/are-good-roads-and-transit-worth-as-much-to-you-as-household-electricity-or-cable-service/?goback=%2Egde\\_1784344\\_member\\_245134438](http://www.artba.org/article/are-good-roads-and-transit-worth-as-much-to-you-as-household-electricity-or-cable-service/?goback=%2Egde_1784344_member_245134438)  
See also , National Capital Region Transportation Planning Board, Metropolitan Washington Council of Governments & the Brookings Institution, "What Do People Think About Congestion Pricing? A Deliberative Dialog with Residents of Metropolitan Washington: A Study of the Public Acceptability of Congestion Pricing in the Metropolitan Washington Region," January 18, 2013, p. 9.  
[http://www.mwcog.org/transportation/activities/congestionpricing/materials/Key%20Documents/CongestionPricingReport-Draft\\_1-18-13\\_ForWeb.pdf](http://www.mwcog.org/transportation/activities/congestionpricing/materials/Key%20Documents/CongestionPricingReport-Draft_1-18-13_ForWeb.pdf) .
44. When traffic reports state the current speed of traffic on specific roadways, this data is derived from tracking cell phone signal hand-offs from one cell tower to the next along a roadway. So people's movements are already being tracked. It is presumed that the data is handled in such a way so as not to compromise the privacy of any individual cell phone user. Likewise, systems can be established to prevent the government from holding data about when and where a car has traveled. But these systems must be explained to the public and the public must have faith in the privacy safeguards that are established.
45. Moving Ahead for Progress in the 21<sup>st</sup> Century Act, (P.L. 112-141, Section 1512), July 6, 2012, 23 U.S.C. 129(a), 23 U.S.C. 166.
46. Rick Rybeck, 2004 op. cit.
47. Joe Dougherty, "Private Developer To Build \$20 Million Va. Metro Station: Public Private Partnership Lauded," *Passenger Transport* (APTA) Vol. 53 No. 47, November 27, 1995. The station was not built because the property was subsequently down-zoned, rendering private payment for creation of the station uneconomical.
48. Rick Rybeck, 2004, op. cit., citing real estate broker, Mark Mallus, addressing area landowners at a meeting in February 2000 in advance of the opening of the New York Avenue Metrorail Station.

49. George Peterson, Unlocking Land Values to Finance Urban Infrastructure, Trends & Policy Options, No.7, International Bank for Reconstruction and Development, 2009, pp 36-40.
50. Econservation Institute, <http://paytnow.org/> .
51. DC Water, <http://www.dewater.com/customer-care/iab.cfm> .
52. Fiscal Year 2013 Budget Support Act of 2012, DC Law 19-0168, Sec 6041 – Sec 6042 amending D.C. Law 17-279; D.C. Official Code § 50-2531 *et seq*, to allow performance-based parking pricing citywide.
53. MWCOC, 20013 State of the Commute Survey, Draft September 17, 2013, p 97.
54. “City Halts Parking Tax Plans – For Now,” Washington Business Journal, August 2, 1996