
MANAGING TRANSPORTATION FINANCING IN AN INNOVATIVE WAY

Xueming CHEN

*Virginia Commonwealth University, 923 West Franklin Street, Richmond, VA 23284
United States of America
xchen2@vcu.edu*

Abstract

Traditional transportation financing is no longer able to meet new transportation financing requirements, therefore an innovative transportation financing program is called for. Innovative transportation financing program can generate new revenue and speed up transportation project delivery process. In spite of its funding potentials, innovative financing mechanism is also constrained by many factors, such as legal authority, eligible uses and others. In the foreseeable future, loan-based financing mechanism will gradually be phased in, and grant-based financing mechanism will gradually be phased out. Innovative funding sources will contribute more to delivering transportation projects, but traditional funding sources will remain dominant in the years to come due to their stable revenue sources.

Keywords: Traditional Transportation Financing; Innovative Transportation Financing; Federal-Aid Highway Program; Cash Flow Tools; Leverage Tools

1. INTRODUCTION

In the United States, traditional transportation financing process, of which the federal-aid grant program is the core, has enabled the construction of an extensive transportation system, especially the Inter-State Highway System. Traditionally, transportation infrastructure has been financed primarily through a combination of federal, state and local taxes and fees. These resources are typically combined to fund projects on a "pay-as-you-go" basis, meaning that projects have often been built in phases or increments as funds become available over a period of years (Source: http://www.transportation-finance.org/funding_financing/financing/). However, the federal-aid grant program's financial limitations are becoming evident in the face of growing investment needs and the lack of available public funding to meet those needs. This funding shortfall is particularly acute for state-level large new investments and major expansions of existing highways, railways and other transportation facilities, the costs of which can amount to hundreds of millions of dollars each. Take Kentucky for example. According to a 2001 report, Kentucky Transportation Cabinet officials estimate that there are some \$22 billion in "unscheduled highway needs" beyond the \$18.2 billion of highway projects which can be accomplished with anticipated Road Fund revenues over the next 20 years (Hackbart, 2001). The federal-aid program typically reimburses state capital expenditures on transportation infrastructure at prescribed rates (historically, up to 80 or 90 percent), and the remainder of project costs is borne by the states. Nowadays, sole reliance on a grant-based reimbursement program may no longer be the most

productive approach for funding certain large infrastructure projects. This traditional transportation financing approach is limited in range, slow to accommodate change, and unable to leverage sufficient private and non-federal capital to meet growing investment needs (Cambridge Systematics, Inc. et al., 1997).

Due to the above limitations, innovative transportation financing strategies came into being in the early 1990s. Though beginning as joint development strategies decades ago, the innovative transportation financing strategies became more popular after the enactment of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA of 1991), and especially after the reconfirmation of the National Highway System Designation Act of 1995 (NHS Designation Act of 1995), the Transportation Equity Act for the 21st Century of 1998 (TEA-21), and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users of 2005 (SAFETEA-LU). The U.S. Department of Transportation has proposed and implemented a toolbox of project finance techniques and strategies that have been put to use for hundreds of projects nationwide, resulting in the acceleration of critical infrastructure investments and attracting new resources to transportation investment (U.S. Department of Transportation, 2010).

This paper intends to succinctly evaluate different innovative transportation financing strategies by analyzing their characteristics, assessing their funding implications, and exploring inherent relations among different financing strategies. A few empirical examples will be used to illustrate their applications in a real world.

2. KEY INNOVATIVE TRANSPORTATION FINANCING STRATEGIES

Innovative transportation financing broadly refers to methods of transportation infrastructure financing other than relying on traditional highway user fees and taxes. In terms of federal-aid to highways, innovative financing means no longer relying on a single strategy of grant reimbursement. Instead, its focus shifts to a diversified approach that provides new options drawn from the most innovative financing concepts developed from both the public and private sectors. ISTEA of 1991, NHS Designation Act of 1995, TEA-21 of 1998, and SAFETEA-LU of 2005 provide transportation planners with an array of new tools to improve the financial management of transportation investment resources.

Based on their relationships with project development phases, two broad types of innovative transportation financing strategies can be distinguished: the pre-construction financing strategies and the post-construction financing strategies. The pre-construction financing strategies include the new financing tools authorized by ISTEA of 1991, NHS Designation Act of 1995, TEA-21 of 1998, and SAFETEA-LU of 2005, whereas the post-construction financing strategies are commonly known as joint development strategies. These two broad types of financing strategies are inherently related with different funding implications and application circumstances.

2.1. The Pre-Construction Financing Strategies

The federal government participates in transportation projects by providing different kinds of financial assistance. Figure 1 illustrates federal assistance for transportation infrastructure.

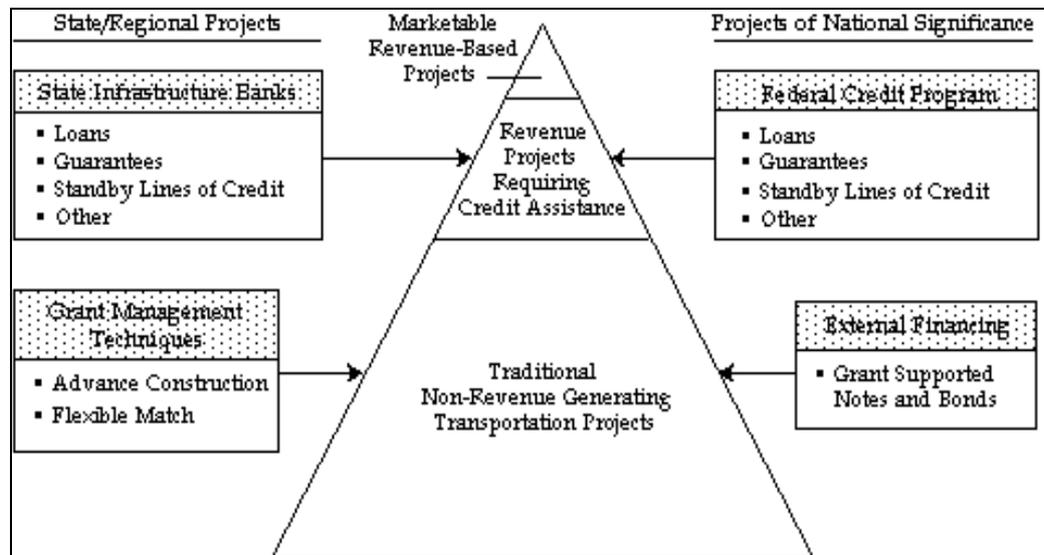


FIGURE 1 - FEDERAL ASSISTANCE FOR TRANSPORTATION INFRASTRUCTURE
 Source: Cambridge Systematics, Inc. et al. (1997)

ISTEA of 1991 introduced two major tools for innovative financing: cash flow tools and leverage tools. These tools were reconfirmed and reinforced by NHS Designation Act of 1995 and other subsequent transportation legislations. Both cash flow and leverage financing tools can be implemented during each project development phase (planning, environmental clearance, design, right of way, and construction). Because of this feature, cash flow tools and leverage tools have direct impacts on project delivery speed and can generally accelerate the completion dates of transportation projects. Table 1 shows different cash flow and leverage financing tools and their characteristics.

Cash flow tools may speed up project delivery process without generating new revenue, whereas leverage tools may generate new non-federal revenue, which will, in turn, accelerate transportation construction process.

As a popular leverage tool, flexible matching requirement is relatively easy to implement because of its low risk involved. TEA-21 of 1998 further removed the requirement that the federal share of project costs be applied to each progress payment. As a result, tapered match is authorized and the established federal share is applied to the total project costs, instead of applying to each progress payment. The use of tapered match, when compared to the use of traditional match procedures, would result in an earlier project completion and a reduced project cost. In addition, tapered match would provide for additional non-federal funds to be leveraged for the project.

TABLE 1 - CHARACTERISTICS OF CASH FLOW AND LEVERAGE FINANCING TOOLS

Type of Strategy	Measures	Definition	Eligible Projects	Conditions	Procedures	Other Requirements
Cash Flow Tools (These tools have something to do with when federal funds become available to States. They are designed to permit federal and non-federal funds to work in a more complementary fashion)	Advance Construction (AC)	The NHS Designation Act of 1995 allows a State to initiate a project using non-federal funds, and to preserve its eligibility for future federal-aid.	NHS (IC/IM), Interstate substitutes, CMAQ, STP, Metro Planning and others.	Except for NHS, IC, and IM, the following conditions must be met to qualify for AC: State has obligated all the funds apportioned, used its obligation authority, or can demonstrate that it will use its obligation authority by end of fiscal year.	Meet same requirements as regular FA project. FHWA and State execute a project agreement. No federal obligation is created until project is converted to regular FA project.	AC projects must be included on STIP, both in year of authorization and year of conversion.
	Partial Conversion of Advance Construction	Partial obligation and partial reimbursement. For AC projects, no federal obligation is created until project is converted to regular federal-aid project.	Same as AC	Same as AC	Same as AC	Same as AC
	Matching Credit for Private Funds, Materials, or Services Donated to FA Projects	This provision allows private funds, materials, or assets to be donated to a specific FA project and permits the state to apply the value to the states matching share.	Any FA projects.	Donations must be made after the date the project is approved by FHWA and prior to approval of final voucher. Donated materials and services must meet the eligibility requirements of the project.	Project should be approved in advance by FHWA	Projects should be included on STIP.
	Bonds and Debt Instruments	States can be reimbursed with federal-aid funds for bond principal, interest costs, issuance costs, and insurance.	Any FA projects eligible under Title 23, U.S.C.	Most projects should be authorized after November 28, 1995.	Project should be approved in advance by FHWA	Projects should be included on STIP.
Leverage Tools (These tools are designed to make more funds available to transportation providers)	ISTEA Section 1012 Loans	States can loan federal-aid funds to toll and non-toll projects with dedicated revenue streams. A loan can be made for any phase of a project including engineering and right-of-way work.	State may loan to public or private entity. Amount loaned is considered an eligible FA project cost. Selection process is governed by State law.	Projects must have dedicated revenue streams, including excise taxes, sales taxes, real property taxes, motor vehicle taxes and others.	Loan may be made at anytime, for any amount provided the maximum federal share is not exceeded (80% of project cost). Loan can be initiated on an active, eligible project, but cannot include work done prior to loan authorization.	Project is carried out in accordance with Title 23 and other applicable federal laws, including any environmental and right-of-way provisions. Initial toll or non-toll project is subject to same basic requirements with FHWA oversight.
	ISTEA Section 1044 Toll Investment Credits	A State can receive an investment credit for certain toll revenue expenditures on highway, bridge, or tunnel infrastructure.	The State can apply the credit towards the non-federal matching share of all program authorized by Title 23 and ISTEA.	Amount of credit is based on revenues generated by the toll authority and is based on non-federal expenditures for capital improvements, excluding maintenance, debt service or costs of collecting tolls.	The toll projects should be approved by FHWA.	The projects should be on STIP.
	State Infrastructure Bank (SIB)	A SIB is an infrastructure investment fund that can be created at the state level to make loans and provide other forms of financial assistance to surface transportation projects.	For any projects, the following items must be completed prior to loan closing: environmental clearance, preliminary engineering, have an identifiable revenue stream.	Revenue payments must begin within 2 years of project completion, maximum amortization term is 20 years. Prepayment of loans are acceptable without penalty.	SIB fund capitalization: 80% federal, 20% non-federal. Projects are evaluated based on their bonus points, equity consideration, revenue potential and other factors.	Revolving loan operation.
Notes:						
AC - Advance Construction	IC - Interstate Construction	SIB - State Infrastructure Bank				
CMAQ: Congestion Management and Air Quality	IM - Interstate Maintenance	STP - Surface Transportation Program				
	ISTEA - Intermodal Surface Transportation Efficiency Act	STIP - State Transportation Improvement Program				
FA - Federal Aid	NHS - National Highway System	U.S.C. - United States Code				

Source: U.S. Department of Transportation (1998)

The most common method of borrowing is to issue bonds that are purchased by investors. The bond issuance yields an immediate influx of cash in the form of bond proceeds. The borrower then retires the debt obligation by making principal and interest payments to the investors over time. Both the private and public sectors can issue bonds for their capital investment, known as corporate bonds and government bonds. Issuance of debt requires a revenue source pledged for repayment. Bonds and debt instruments should be employed very carefully. Typically, an investment rating and future revenue forecasts should be conducted beforehand. For example, Build America Bonds (BABs) were authorized by the American Recovery and

Reinvestment Act, which was enacted in February 2009. BABs are taxable bonds that are eligible for an interest payment subsidy paid directly from the U.S. Department of Treasury. Surface transportation projects are among other public infrastructure projects that are eligible for BAB financing (AASHTO and U.S. Department of Transportation, 2010; U.S. Department of Treasury, 2009). Another example of bond is Grant Anticipation Revenue Vehicles (GARVEE) bond. Many states issue GARVEE bonds to finance their transportation projects. For instance, North Carolina's enabling legislation for GARVEEs was passed in August 2005, authorizing the issuance of \$900 million (Federal Highway Administration, 2009).

ISTEA Section 1012 loans and ISTEA Section 1044 Toll Investment Credits mainly impact toll-related highway projects. Toll projects can take the form of either build-operate-transfer (BOT) or build-transfer-operate (BTO), depending on particular circumstances. Toll projects are normally located along those corridors that are most congested, lack alternative routes and are economically wealthy. This may be conducive to attaining both efficiency and equity goals.

State Infrastructure Bank (SIB) can help fund small-scale and short-term projects based on the revolving loan operation concept. Typically, state/regional projects will be funded through loans, loan guarantees, standby lines of credit and other financing tools. For example, Texas was one of the 10 States chosen to test the SIB pilot program created under the 1995 NHS Act. In 12 years, the SIB has helped fund and expedite more than \$3.4 billion in transportation projects through 88 loans with a total dollar value of \$374.6 million. Over 21 percent of approved SIB loans in Texas are for transportation improvements in the Texas-Mexico border region (Texas Department of Transportation, 2010).

2.2. The Post-Construction Financing Strategies

The post-construction financing strategies referred to in this paper include commonly-known joint development strategies, which are typically implemented after the project construction is completed. Because of this feature, joint development strategies generally do not have direct impacts on project delivery speed. However, they may generate a substantial amount of revenue to back some pre-construction financing strategies. Joint development, which falls under the category of value capture, has been an important financing tool since the 1980s with many highway and transit applications. Table 2 lists the most important joint development strategies and their characteristics.

Joint development strategies are generally applied to large-scale transit projects, such as subways and other major investment projects, due to their large magnitude, time permanency, and profound impacts on adjacent land uses.

Transit agencies can benefit from monetary or land donations from commercial retailers, whereas commercial retailers can also benefit from increasing customers due to their geographic adjacency to transit projects. Therefore, both public and private parties are mutually beneficial.

TABLE 2 - CHARACTERISTICS OF KEY JOINT DEVELOPMENT STRATEGIES

Type of Strategy	Measures	Definition	Financial Results	Legal Issues	Political Issues
Assessments	Connector Fees/Service Charges	These are charges to owners or developer of buildings adjacent to a transportation facility, for being connected to it.	This measure can pay for either capital costs or operating costs of transportation projects.	Transportation agencies must have the legal authority to negotiate connector fees and service charges.	This measure does not have apparent political oppositions.
	Special Benefit Assessments	A special benefit assessment is a tax or fee on all properties within a special benefit district to pay for all or a part of the cost of specific improvements made within the district.	Special benefit assessments can be used to pay for up to 100% of the capital and operating costs of transit facilities or services within the district.	Special state enabling legislation and intergovernmental agreement authority are normally required.	This does not create a new community-wide tax and therefore may be politically desirable method of raising revenues to address a specific need.
	Tax Increment Financing	This is a method of financing public involvement with dedicated property tax revenues.	This has the potential of generating significant revenues, depending on the local ad valorem tax rate, the size of district and others.	State enabling legislation and subsequent local ordinances are required to establish Tax Increment Financing District.	Resistance comes from other taxing jurisdictions, such as school districts or hospital districts, which rely heavily on property tax revenues.
	Transit Impact Requirements	These are fees and/or obligations imposed upon developers to mitigate the impact of their new projects on transit services.	The revenue potential can be significant. However, overly stringent requirements may cause developers to locate their developments elsewhere.	For requirements specified by law, local ordinances are necessary.	Developers may object to requirements, arguing that they discourage growth and impose unfair economic burdens on their businesses.
Use of Property and Property Rights	Negotiated Land Leases	These are agreements between private developers/land owners and transit agencies, under which land is leased to the agency in exchange for construction of a transit facility.	Transit agencies benefit from not having to condemn and buy needed land and possibly from receipt of actual funding for operating or capital purposes.	Transit agencies need authority to contract with private property owners.	Transit agencies rarely encounter public opposition to land leases. Political considerations are more important during negotiation of the lease terms.
	Leasing/Selling Development Rights	Transit agencies may capture partial to full value of their land holdings by leasing or selling development rights associated with space above, below or adjacent to their facilities.	This is a way of generating substantial amounts of revenue for transit agencies.	Property owners question if local eminent domain powers permit public entities to acquire the air and subsurface rights associated with condemned land parcels.	The public may complain that the lease/sale agreement benefits the private developers more than the public sector.
	Leasing/Selling of Existing Facilities	Transit agencies may be overlooking vacant or underutilized properties as a source of revenue, such as transit terminals, park and ride lots and others.	Transit agencies need special authority to purchase and dispose of land or facilities no longer needed for transit purposes.	This measure rarely generates political opposition.	Utilization by transit agencies has been limited, although leasing facilities is not new to municipalities.
Contracted Services	Turnkey Process	This process permits transit agencies to contract with one developer for delivery of a fully-completed and operational project.	This is usually adopted as a time-saving device, but it often has the benefit of saving money, relative to the standard capital improvement process.	Agencies will need authority to acquire improved real estate through proposal and negotiation. This process is ineligible for federally funded projects because it deviates from federal bidding and labor requirements.	Political problems may arise if contractors try to enlist political support for their projects.
Voluntary Participation	Private Donations	The private donations, cash or in-kind, are usually related to capital improvements which in some way benefit the donor.	Projects suitable for private donations are characterized by factors that influence the perceived value of the proposed service or improvement.	Usually an agreement between the two parties is signed in acknowledgement of the donation.	Persuasive presentations about project related benefits and politically sensitive negotiations with potential donors may be the key to successful solicitation of contributions.

Source: Rice Center (1985)

Besides transit projects, highway projects can also benefit from joint development strategies. For example, gas station is normally located near freeway exit. Highway agency can reasonably charge connector fee on gas station owner upon being legally authorized. Likewise, motorists can also be charged a fee for using rest areas along freeways.

Implementation of joint development strategies requires legislative supports and legal authorities granted. Joint development strategies, such as special assessment districts, can sometimes generate millions of dollars to support urban mass transit projects, supplementing traditional funding sources. However, each strategy has its own restrictions and eligible uses. For example, public/private joint development revenue can only be used on development of company property and rental property to increase revenue from tenant rent.

3. LINKAGES AMONG DIFFERENT TRANSPORTATION FINANCING STRATEGIES

There are different kinds of linkages among transportation financing strategies. This paper focuses on two linkages: linkages between the pre-construction financing strategies and the post-construction financing strategies; and linkages between the traditional financing strategies and the innovative financing strategies.

3.1. *Linkages between the Pre-Construction Strategies and the Post-Construction Strategies*

At first glance, it appears that the pre-construction strategies and the post-construction strategies are unrelated. But in actuality, they are still related in the following ways:

- 1) Before any debt-related financing strategies are implemented, transportation agencies need to assure lenders that principals plus interests will be repaid with future revenue. Though traditional funding sources such as sales taxes will provide a lion share of stable revenue stream, joint development can also generate a substantial portion of revenue to back debt-related financing strategies;
- 2) Different modes have different pre-construction and post-construction relationships. For toll facilities, loan amounts will be repaid by expected tolls. But for transit projects, bonds may be repaid through any combination of special benefit assessment revenue and traditional funding sources; and
- 3) There exists a somewhat overlapping between the pre-construction strategies and the post-construction strategies. For example, private donations may belong to both the pre-construction strategies and the post-construction strategies.

3.2. *Linkages between the Traditional Financing Strategies and the Innovative Financing Strategies*

Both the traditional transportation financing strategies and the innovative transportation financing strategies are integral components of entire transportation financing strategies.

At present, traditional funding sources remain dominant, while innovative funding sources are merely supplemental. Both financing strategies should better be integrated to enhance their synergistic effects.

Traditional financing strategies and innovative financing strategies are closely related in the following ways:

- 1) Cash flow tools and leverage tools are actually integrated into traditional financing process. For example, advance construction (AC) projects must be included in State Transportation Implementation Program (STIP); AC projects must meet the same requirements as regular federal aid projects. Flexible match represents a leverage tool, but local match requirement itself is a key feature of traditional financing process. In other words, cash flow tools and leverage tools simply relax some rigid requirements of traditional financing process without fundamentally reforming them;
- 2) Bonds and other innovative debt instruments can be repaid by expected sales taxes and other traditional financial resources; and
- 3) Innovative financing strategies simply refine but cannot replace traditional financing strategies. Traditional financing strategies provide more stable revenue streams.

4. EXAMPLES OF INNOVATIVE TRANSPORTATION FINANCING

4.1. Capital Beltway/I-495 High Occupancy Toll (HOT) Lanes, Virginia

As illustrated in Figure 2, the Capital Beltway/I-495 HOT Lanes Project in Virginia includes the construction of four HOT lanes (two in each direction) added to the Capital Beltway/I-495 between the Springfield Interchange and just north of the Dulles Tollway. The HOT lanes will use electronic tolling technology and dynamic pricing to continuously adjust toll rates to manage traffic flow.

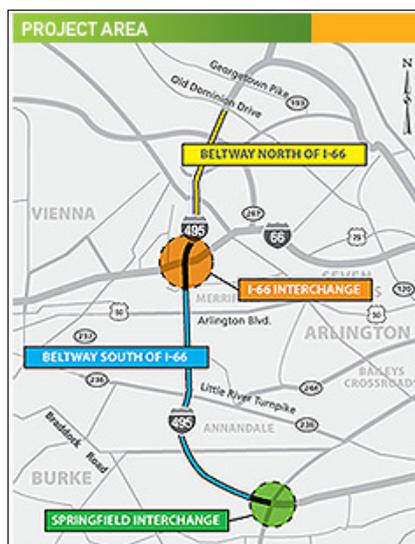


FIGURE 2 – MAP OF THE CAPITAL BELTWAY/I-495 HIGH OCCUPANCY TOLL (HOT) LANES
 Source: <http://www.virginiahotlanes.com/>

The project is being advanced under an 85-year concession agreement (5-year construction period, plus 80-year operating concession) with the Virginia Department of Transportation (VDOT) and Capital Beltway Express, LLC (private concessionaire).

Financing for the nearly \$2-billion project includes \$585.6 million in Private Activity Bonds (PABs) and \$585.5 million from a Transportation Infrastructure Finance and Innovation Act (TIFIA) direct loan, combined with a State grant (\$409 million), private equity (\$349), and interest income (\$69 million) (Source: http://www.transportation-finance.org/projects/i495_capital_beltway_hotlanes.aspx). This is the first project to issue PABs of the eight projects that were approved to issue PABs under the \$15-billion SAFETEA-LU allocation [Note: PABs are debt instruments issued by State or local governments in which bond proceeds are used to finance a public use project developed by a private entity (National Surface Transportation Policy and Revenue Study Commission, 2007)].

The PABs were issued by a newly created not-for-profit entity in compliance with provisions of Internal Revenue Service Revenue Ruling 63-20, which allows certain private entities to issue tax-exempt debt on behalf of a unit of government. Construction began in Spring 2008, and the project is scheduled for completion by 2013 (Sources: FHWA IPD Web site: http://www.fhwa.dot.gov/ipd/case_studies/va_capital_beltway.htm; AASHTO's Center for Excellence in Project Finance: http://www.transportation-finance.org/projects/i495_capital_beltway_hotlanes.aspx; Virginia Mega Projects: <http://www.vamegaprojects.com/about-megaprojects/i495-hot-lanes/>).

4.2. Pocahontas Parkway (Initial Construction Financing), Virginia

The Pocahontas Parkway (Route 895) is an 8.8-mile tolled highway, located 7 miles south of Richmond, Virginia. The four-lane road connects Chippenham Parkway at I-95 in Chesterfield County with I-295 south of the Richmond International Airport in Henrico County. See Figure 3.



FIGURE 3 – MAP OF THE POCAHONTAS PARKWAY

Source:

[https://www.ezpassva.com/\(S\(sbcllm5524p2wk55uzaigqk\)\)/TollFacilities/Pocahontasparkway.aspx?AspxAutoDetectCookieSupport=1](https://www.ezpassva.com/(S(sbcllm5524p2wk55uzaigqk))/TollFacilities/Pocahontasparkway.aspx?AspxAutoDetectCookieSupport=1)

Construction began in the Fall of 1998, and the Parkway was opened to traffic in stages beginning in May 2002. The project was the first unsolicited proposal for a highway project developed under Virginia's Public-Private Transportation Act of 1995. The project was delivered through a design-build contract and included the creation of a nonprofit 63-20 corporation, the Pocahontas Parkway Association (PPA), which had the authority to issue tax-exempt bonds to provide a share of the project financing. The initial design and construction were funded through: Tax-exempt toll revenue bonds - 354 million; Federal funding—\$9 million for design costs; SIB loan—\$18 million (Source: http://www.fhwa.dot.gov/ipd/p3/case_studies/case_study_pocahontas.htm).

4.3. Benefit Assessment Districts Program of the Los Angeles Metro Red Line Subway System

In addition to its traditional funding sources (local, state and federal), the Los Angeles County Metropolitan Transportation Authority (LACMTA) has been using the following innovative financing strategies to generate transportation revenues:

- Benefit Assessments;
- Other (Advertising, Auxiliary & Charter);
- Public/Private Joint Development;
- Certificates of Participation;
- Commercial Paper;
- Cross Border Lease;
- Senior Lien Bonds; and
- Subordinated Bonds.

This section only highlights LACMTA's Benefit Assessment Districts Program of the Los Angeles Metro Red Line Subway System. Benefit assessment is a fee on properties used to pay part or all of the cost of capital improvements enhancing the value of property receiving service from or located near and benefiting from the capital improvements.

The LACMTA Board of Directors has established benefit assessment districts and levy assessments along the Metro Red Line subway system stations. See Figure 4 for station details.



FIGURE 4 – MAP OF THE LOS ANGELES METRO RED LINE SUBWAY SYSTEM
 Source: Los Angeles County Metropolitan Transportation Authority (1997)

The Los Angeles Metro Red Line System has 16 stations, 15 of which have established benefit assessment districts:

- Segment I (5 stations): Union Station, Civic Center/Tom Bradley, Pershing Square, 7th St/Metro Center, and Westlake/McArthur Park;
- Segments II & III (10 stations): Wilshire/Vermont, Wilshire/Normandie, Wilshire/Western, Vermont/Beverly, Vermont/Santa Monica/LACC, Vermont/Sunset, Hollywood/Western, Hollywood/Vine, Hollywood/Highland, North Hollywood.

Total Segment I benefit assessment revenue is \$130.3 million or roughly 10% of the Segment I construction costs. The benefit assessment rate for Segment I is 30 cents per square foot of gross building area per year, which can vary to a maximum of 42 cents per square foot per year, depending on the bond repayment schedule and the level of real estate growth that occurs.

Segments II & III alone will provide benefit assessment revenues in the amount of \$66.75 million in station costs, which comprise 2.5% of total construction cost (\$2.76 billion) for Segments II & III (North Hollywood Extension). And an “in-lieu” contribution will be made at Universal City station.

Assessable properties include: offices, retail stores, hotels/motels, other commercial properties, and freestanding parking garages not used to meet zoning requirements of an associated use. Assessable

parcels with non-assessable improvements include: wholesale, manufacturing, industrial, improvements vacant due to regulatory requirements, parking (except in Segments II and III for freestanding parking garages), and vacant land. Exempt properties include: residential, non-profit owned and used, and publicly owned and used.

Each property owner subject to assessment has three payment options:

- Option One: pay in one lump sum discounted from the scheduled opening date of the transit station (cost to owner ranges from a one-time \$0.86 to \$1.06 per an assessable square foot);
- Option Two: pay in five annual installments with amount due discounted and then annualized with annuity over the five year (cost to owner ranges from \$0.21 to \$0.26 per one assessable square foot annually over the five years); and
- Option Three: pay over a 29 year period beginning when the transit station nearest the property opens after the sale of bonds (cost to owner ranges from \$0.09 to \$0.19 per one assessable square foot annually and averaging approximately \$0.15).

Annual assessment income goes directly to cover interest and principal payments on approximately \$162 million in assessment district bonds which were sold in 1992.

5. FINDINGS AND RECOMMENDATIONS

The Federal-Aid Highway Program (FAHP), which represents the traditional transportation financing program, is no longer able to meet new transportation financing demand, its rigid structure, slowness to accommodate new change, and inherent funding inflexibility have become barriers to accelerate transportation projects throughout the nation.

In contrast, innovative transportation financing presents new opportunities and advantages: more revenues can be generated through private sources, public/private partnership and others; project delivery process can be accelerated through advance construction, flexible match and new project implementation process. Because of these advantages, innovative transportation financing strategies will become more popular in the future.

This paper holds that, in the foreseeable future, loan-based financing mechanism will be gradually replacing grant-based financing mechanism. This will make more transportation projects self-supporting, which, in turn, calls for a higher revenue-generating capability and a lower operating cost. Meanwhile, the existing rigid eligibility requirements for different funding sources may further be relaxed, similar to the relaxation of flexible match requirement. More innovative transportation financing strategies, including congestion tolls, are expected to be introduced to accommodate for new funding challenges.

While it is necessary to introduce more innovative transportation financing strategies, we still cannot totally get rid of traditional transportation financing strategies because most transportation dollars still come from traditional sources, such as sales taxes, gasoline taxes and other miscellaneous fees. Because of this fact, innovative transportation financing strategies can only supplement but cannot replace most of traditional transportation financing strategies in the years to come, though some inadequate traditional financing mechanisms will gradually be phased out. For a particular region, due to its unique circumstances, the most appropriate mix of traditional and innovative transportation financing measures should be carefully laid out.

REFERENCES

- AASHTO and U.S. Department of Transportation (2010). *Finance*. Retrieved February 29, 2012 from: <http://www.transportation-finance.org>.
- Cambridge Systematics, Inc., Apogee Research, Inc., and Fitch Investors Service, L.P. (1997). *Federal Credit for Surface Transportation: Exploring Concepts and Issues*. Prepared for the Federal Highway Administration.
- Federal Highway Administration (2009). North Carolina Takes Flexible Approach to GARVEE Bond Issuance., *Innovative Finance Quarterly*, 14(1).
- Hackbart, M. M. (2001). *Innovative Financing Options for Kentucky's Transportation Infrastructure*. Lexington, KY: University of Kentucky.
- Los Angeles County Metropolitan Transportation Authority (1997). *Benefit Assessment Districts Program Overview*. Los Angeles, CA: Los Angeles County Metropolitan Transportation Authority.
- Rice Center (1985). *A Guide to Innovative Financing Mechanisms for Mass Transportation*. Washington, DC: US Department of Transportation.
- Texas Department of Transportation (2010). *State Infrastructure Bank (SIB)*. Retrieved February 29, 2012 from: <http://www.txdot.gov/business/governments/sib.htm>.
- U.S. Department of Transportation (1998). *Innovative Finance and Statewide Financial Planning Course Manual*. Washington, DC: US Department of Transportation.
- U.S. Department of Transportation (2010). *Project Finance Primer 2010*. Washington, DC: U.S. Department of Transportation. Retrieved February 29, 2012 from: <http://www.fhwa.dot.gov/ipd/pdfs/finance/ProjectFinancePrimerREV4.pdf>.
- U.S. Department of Treasury (2009). *Guidance on Build America Bonds*. Washington, DC: U.S. Department of Treasury. Retrieved February 29, 2012 from: <http://www.irs.gov/pub/irs-drop/n-09-26.pdf>.