

# Public-Private Partnerships (PPP) in Transportation: An Analysis of Alternatives

by Anthony M. Pagano

*Public-Private Partnerships (PPP) are in the forefront of approaches to funding transportation infrastructure improvements. Highlighted in the highway area by long-term leases of the Chicago Skyway and Indiana Toll Road, a variety of states are investigating the use of public private partnerships either as “Brownfield” leases like the Chicago and Indiana cases, or “Greenfield” Design, Build, Operate, Transfer arrangements. These and other PPP projects raise a variety of issues, including the length of the lease, toll escalation permitted, and use of funds. This paper develops a rationale for PPPs in transportation, evaluates several approaches to PPPs using this rationale, and analyzes some of the difficult issues that can surface.*

## INTRODUCTION

The world of public private partnerships (PPP's) changed in the United States in 2004 with the Chicago Skyway long-term lease agreement. In exchange for an up front payment of \$1.83 billion, the Skyway Concession Company comprised of Cintra and Macquarie Infrastructure Group will operate the facility for 99 years. This lease was followed in 2005 with the lease of the Indiana Toll Road. The deal involved an up front payment of \$3.8 billion to the State of Indiana for the right to operate the road for 75 years, Ortiz and Buxbaum (2008). The City of Chicago has been pursuing a lease of Midway Airport. These types of deals are numerous in Europe and developing countries, but have not been used very much in the United States. This paper develops a rationale for PPPs in transportation, evaluates several approaches to PPPs using this rationale, and analyzes some of the difficult issues that surface.

## THE RATIONALE FOR PUBLIC INVOLVEMENT IN TRANSPORTATION DECISIONS

In order to understand the rationale for public-private partnerships in transportation, it is necessary to begin with an understanding of the rationale for public involvement in transportation decisions. To begin, it is necessary to make a distinction between government involvement in transportation decisions and public provision of transportation facilities and services. Government involvement does not mean that government must actively develop and operate transportation facilities. A variety of reasons can be cited for government involvement in transportation decisions. These reasons center on market failure in transportation markets. This means if left to the private sector only, transportation services would not be produced in socially optimal amounts.

One reason for government involvement concerns the nature of transportation markets. Either because of institutional reasons, the lumpiness of productive factors used to produce transportation, or because of decreasing costs with greater density along given routes, free entry into the production of transportation facilities and services may be precluded to the point that monopoly may result. Without governmental involvement, market forces may fail to provide an optimal allocation of resources to transportation. Exclusive private provision may result in only one or a few providers, producing a level and quality of transportation services that is less than desirable.

A second reason concerns the externalities resulting from transportation, both positive and negative. These include land use impacts, economic development impacts, and air, noise, and water pollution, among others. If left solely to private providers, the social costs and benefits of transportation may not be fully taken into account.

To the extent that transportation services are public goods, then public involvement in transportation decisions can be justified as a third reason. Public goods have two characteristics which result in lack of private supply in adequate amounts. The first characteristic is non-exclusion. Individuals can be excluded from the consumption of private goods provided by the free market if they do not pay for them. The characteristic of non-exclusion means that if private business would attempt to supply public goods, they could not obtain payment from all consumers of the service. Although altruism may motivate some businesses, the lack of adequate revenues is a powerful deterrent to private provision of transportation services.

The second characteristic of public goods is joint supply. This means that if the good or service is provided to one individual, it is jointly provided to everyone. The marginal cost of supplying one additional consumer is very low or zero. If price is set equal to marginal cost, private provision would not be forthcoming.

Other reasons for government involvement include the high risk and payback periods associated with large transportation projects, equity considerations (providing access to employment opportunities, shopping, and other opportunities), and the mobility options provided by access to alternative modes of transportation.

These reasons suggest that government should be involved in decisions concerning transportation facility and service levels. The public sector may need to subsidize some services. It should also participate in the planning and coordination of such services.

## **RATIONALE FOR PUBLIC PRODUCTION OF TRANSPORTATION SERVICES**

While a case for government involvement in transportation decisions can be made, it is less obvious why government should be involved in the actual production of transportation services.

First, some functions require such elaborate supervision that even if they were produced by private firms, the situation would be the equivalent of public production. In his classic book on public finance, Musgrave (1959) cites the operations of military establishments and the administration of justice as examples. Services such as these require close control on the part of the electorate or representatives of the people in a democratic society. However, transportation is not quite like the military, police, or the courts. The necessity for close supervision does not seem to be a valid reason to justify public operation of transportation facilities.

A second reason for public production of transportation services concerns the problems of natural monopoly. Public production is an alternative to regulated or unregulated private monopoly. This justification rests on the premise that public production results in better outcomes than the other two alternatives. It is a matter of judgment whether this premise is correct.

Inertia may also explain why some services are produced in the public sector. Education and the postal monopoly are good examples.

As can be seen from this discussion, public production of services in general, and production of transportation services in particular, may not be justified in many situations.

## **RATIONALE FOR PRIVATE SECTOR INVOLVEMENT**

An important question to ask is why would private sector involvement be more desirable? The answer centers on the two types of efficiency. Allocative efficiency exists if resources are devoted to the highest value in use. In the case of transportation, allocative efficiency exists if the amount and quality of transportation produced is at an optimal level. Allocative efficiency thus concerns what and how much to produce. The previous discussion of why government should be involved in transportation decisions involves allocative efficiency.

The second type of efficiency is called productive, managerial, cost or X-efficiency in Leibenstein's (1966) terms. Efficiency in this sense implies that production is maximized for a given level of inputs.

This type of efficiency is concerned not with how much to produce, but rather with how to produce it. A given level of transportation is provided efficiently in this sense if production costs are minimized.

In the private sector, competitive forces and the desire to maximize profit and stay in business provide incentives for firms to achieve this second type of efficiency. In a purely competitive situation, only those firms that have maximized cost efficiency can survive.

In the public sector, on the other hand, the incentives to achieve efficiency in the provision of public services are indirect. Incentives are provided through the political system by voters, legislators and appointed commissions. If efficiency in the provision of these services is not achieved, then this indirect process may take some time to make adjustments. In many situations, adequate adjustments may never be made.

This indirect process may involve voting a party or elected official out of office. However, many issues are usually involved in a decision as to which candidate to vote for. Waste and inefficiency in the provision of public services may be hidden under an array of other problems and issues. The process may also involve legislatures passing laws which attempt to provide incentives for the efficient administration of government programs. However, dedicated public administrators must implement these laws and deal with an entrenched bureaucracy protected by civil service status. This bureaucracy may remain largely unaffected by attempts to streamline public programs.

Special commissions perform studies and make recommendations to produce government services more efficiently. However, in many cases these reports seem to end up on a bookshelf rather than being implemented. The problem is that the direct incentives of profit, loss, and competition in the private sector are not present in the public sector.

## **RATIONALE FOR PUBLIC-PRIVATE PARTNERSHIPS**

This discussion suggests that a combination of public-private sector involvement in transportation would result in a better achievement of both types of efficiencies. If sole reliance is placed on the private sector, market failure may result. Allocative efficiency may not be attained. If sole reliance is placed on government to provide transportation services, cost efficiency may not result.

However, if the public sector maintains a role in transportation such as planning, coordination, and possibly subsidy, and the private sector is used to actually operate the system, then possibly both types of efficiency could be attained. This is especially true if private sector partners can be obtained through competitive markets or a competitive bid process.

This public-private partnership is what Osborne and Gaebler (1993) called *Steering vs. Rowing*. In their view, government and the private sector should specialize in what each sector does best. Government is best at steering – deciding what to produce, how much to produce, and allocating resources to production. The private sector is best in actually producing the service. Each sector specializes in its core business function.

There are other rationales for public-private partnerships that include capital shortages of financially strapped jurisdictions, ability to access value in the facility, the ability to raise tolls independent of political considerations, and transfer of risk from the public sector to the private. For details on the kinds of risks that can be transferred see FHWA (2007). The implementation of a PPP based on these rationales may also have an effect on both allocative and cost efficiency potential.

## **TYPES OF PUBLIC-PRIVATE PARTNERSHIPS**

There are a variety of public-private partnerships that have been practiced in transportation. Some are designed to achieve the allocative and X-efficiency goals outlined above. Others, however, may have far different motivations. Table 1 shows a categorization of alternative public-private partnership approaches to the provision of transportation services. This table shows broad categories of approaches. Within each category, there could be several alternative ways in which the public and private sectors interact.

**Table 1: Alternative Public-Private Partnership Approaches in Transportation**

<b>Approach</b>	<b>Private Sector Role</b>	<b>Public Sector Role</b>
1. Design Build	Design and Construction of Facility	Planning, Operation and Subsidy of Facility
2. Build, Operate Transfer (BOT) or DBOT – Greenfield Concession	Build, Operate, Finance, Maintain, Transfer	Negotiation with private companies, regulation, contract enforcement, quality assurance
3. Long Term Lease of Existing Facility – Brownfield Concession	Finance, Operate, Maintain, Transfer	Negotiation with private companies, regulation, contract enforcement, quality assurance
4. Competitive Contracting	Operation and Maintenance	Negotiation with private companies, regulation, contract enforcement, quality assurance, subsidy
5. Asset Sales	Finance, Operate, Maintain	Negotiation with private companies or no role
6. Vouchers	Finance, Operate, Maintain	Negotiation with private companies, subsidy, quality assurance
7. Deregulation	Build, Operate, Finance, Maintain	None
8. Publicization	Build, Operate, Finance, Maintain	Planning, Subsidy

The first approach is Design-Build. The private sector designs and constructs the new facility. The public sector role is planning, operation, and subsidy of the facility. This is the classic approach to public-private partnerships by which most of the highway system in the United States was constructed.

The second approach is Build, Operate Transfer (BOT) or Design, Build, Operate Transfer (DBOT). In this approach, the private sector builds, operates, finances, and maintains the facility, and then over a period of years, transfers the facility to the public sector. This is called a “Greenfield Concession” since a brand new facility is built. There are a variety of roles that the private sector can play in this type of PPP. The private sector can finance the facility or financing can be done by the public sector. One important question is should these roles be performed by the same or different firms. Marimort and Pouyet (2008) analyze whether building infrastructure and managing assets should be bundled or not. They conclude that a technology-driven reason is the basis for this decision.

The public sector is involved in negotiation with private companies, possible regulation of prices, contract enforcement, and quality assurance. This approach has been widely used in developing countries where there is a capital scarcity. The length of the concession can vary up to 99 years. Most typical are concessions that last for 30–50 years. Details on various alternatives within this approach can be found in Buxbaum and Ortiz (2009).

A long term lease of an existing facility, called a “Brownfield Concession,” is the third approach. This is the approach that has gained much notoriety after the leases of the Chicago Skyway and the Indiana Toll Road. The possible lease of Midway Airport is also this type. The Chicago Skyway lease was the first in the United States. This type of PPP has raised many questions, which will be discussed later in this paper.

Competitive Contracting is the fourth approach. In this approach, the public sector contracts with the private sector to operate and maintain a service. The public sector is involved in negotiation with the private sector, regulation, contract enforcement, quality assurance, and subsidy of the service. This type

of PPP is prevalent in public transit throughout the country, including service in Denver, Phoenix, Los Angeles suburbs, and Chicago suburbs. Much of the paratransit service in the United States is provided through this approach. For a discussion of a variety of contracted services in transit see Richmond (2001).

The fifth approach is Asset Sales. This approach is used to privatize State Owned Enterprises (SOE). The private sector takes the role of financing, operating, and maintaining the facility. The public sector role is either to negotiate a sales price with private companies or no role. There are two types of asset sales. One is a Citizen Share Purchase, in which the asset is sold to an individual company or shares are sold in the marketplace. In this approach, the government keeps all the proceeds from the sale. The privatization of Conrail was done in this manner. The second approach is called “Voucher Privatization” by Pool (1996). In this approach, the SOE is privatized by distributing shares to citizens of the country. Citizens are free to sell or keep their shares. In this case, the proceeds from the sale accrue to individuals rather than to the government. British Columbia used this approach in the privatization of its state-owned forest products and natural gas companies. Pool (1996) notes that this approach was also used by the Czech Republic in privatizing its SOEs. Asset sales are similar to “Brownfield Concessions,” except the facility is permanently transferred to the private sector.

The next PPP approach is Vouchers. In this approach, vouchers are provided to users of the service to purchase the service from private operators. Private companies are responsible for all aspects of their service, while the public sector negotiates with the private companies on the basis of price and quality of service. The public sector also subsidizes the service and monitors quality. This approach has been used extensively in paratransit operations in the United States and in school vouchers in several cities.

In Deregulation, the public sector allows private competition with a formerly monopoly public sector operation. The private sector is responsible for all aspects of their service, while the public sector plays no role in the private sector operation. The U.S. postal service, which allows competition from FedEx and UPS for overnight and package delivery, is a good example of this approach. While not necessarily a public-private partnership, the private sector competition can result in the public sector becoming more efficient and effective in the provision of its services.

The last PPP approach can be called “Publicization.” In this approach, the public sector becomes involved in what was an exclusive private operation. Publicization is not nationalization, since there is a very large role played by the private sector. Examples include the CREATE project in Chicago, where the public sector is working with the railroads to reduce time spent in the Chicago terminal, and the Wisconsin and Southern Railroad in Wisconsin, in which the state has acquired the trackage on which the private railroad operates. Other examples include the Alameda Corridor project in Southern California, the BNSF Flyover in Kansas, the FAST project in the state of Washington, and the Sauk Village Logistcenter development in suburban Chicago. In each of these cases, the public sector has become involved in what has traditionally been a strictly private sector endeavor to build, maintain, and operate freight transportation infrastructure. Also included in this category are various approaches to transit-oriented development and joint development agreements.

Other PPP approaches are strictly financial, such as Business Improvement Districts (BID), which involves assessing businesses which are adjacent to a transportation development, and Tax Increment Financing (TIF), in which increased property tax revenues pay for current infrastructure investment (FHWA 2007).

## **EVALUATION OF THE ALTERNATIVE APPROACHES**

Given the variety of alternative public-private partnerships, the next question is how well do each of these achieve society’s transportation goals. In order to answer this question, each approach is analyzed for its potential in achieving allocative and cost efficiency. This potential may or may not be achieved in practice. However, it is more likely that efficient operations would result if a high potential approach were implemented, rather than one with poor potential. The results of this analysis are shown in Table 2.

**Table 2: Evaluation of Public-Private Partnership Approaches in Transportation**

<b>Approach</b>	<b>Allocative Efficiency Potential</b>	<b>Cost Efficiency Potential</b>
1. Design Build	Excellent	Poor
2. Build, Operate Transfer (BOT) or DBOT – Greenfield Concession	Depends on Specifics of the Contract	Excellent
3. Long Term Lease of Existing Facility – Brownfield Concession	Depends on Specifics of the Contract	Excellent
4. Competitive Contracting	Excellent	Excellent
5. Asset Sales	Good – Depends on Details	Good
6. Vouchers	Excellent	Excellent
7. Deregulation	Excellent	Good to Poor
8. Publicization	Excellent	Good

The potential for an approach to achieve allocative efficiency would be present if the alternative has a strong potential to achieve an optimal allocation of resources to transportation services. This includes the potential to take externalities into account in production decisions, the public goods nature of some facilities, and the avoidance of private monopoly. In addition, allocative efficiency results if equity considerations can be dealt with and if the approach can provide a funding mechanism for large, risky projects with long payback periods. Cost efficiency potential is present if the implementation of an approach results in the creation of incentives to be efficient.

Each of the approaches is ranked as excellent, good, or poor in potential to achieve these efficiencies. For allocative efficiency, excellent implies that implementing an approach will most likely lead to effective use of resources in transportation. The socially desirable amount and type of transportation has the best chance of being achieved under these alternatives. Allocative efficiency is ranked as good if the alternative can lead to a social optimum in transportation, but this really depends on the details of the contract between the public and private sectors.

A cost efficiency potential is ranked according to the extent to which incentives to be efficient are present in an alternative. Excellent implies that market mechanisms are operating efficiently in that alternative. Alternatives ranked as good imply that the market may have an effect on cost efficiency, but other factors such as monopoly provision may hinder cost efficiency goals. Those ranked as poor imply that political rather than market mechanisms determine the efficiency of delivery of services.

The traditional approach, Design Build, involves the public sector actually planning, operating, and subsidizing the facility. The private sector role is design and construction of the facility. The allocative efficiency potential is excellent since the public sector can deal with externalities, public goods effects, and equity. However, the cost efficiency potential is quite low. The incentives to be efficient are indirect with this approach.

Greenfield Concessions have been used for many years in less developed countries. They directly deal with the problem of capital scarcity by being able to access private capital markets. The cost efficiency potential is excellent, since the incentives of the marketplace are at work in this approach. However, the allocative efficiency potential depends on the specifics of the contract with the private sector. This is also the case for the Brownfield Concession approach. However, both of these approaches raise many troubling issues which must be dealt with. In the next section of this paper, several of these issues will be discussed.

Approach 4 is competitive contracting. This approach has an excellent potential to achieve both types of efficiencies. The public sector can take a large role in planning services, internalizing external

effects, and taking equity considerations and other allocative efficiency effects into account. Relying on competitive bids, inefficient operators would be underbid by better managed firms. As long as many operators are competing, the potential for cost efficiency is excellent.

Asset sales have a good chance of achieving both allocative efficiency and cost efficiency goals. However, like Greenfield and Brownfield Concessions, the devil is in the details. If the sale results in monopoly private operation of the facility, then cost efficiency goals may not be fully obtained. However, if the SOE is highly inefficient, with many layers of bureaucracy and unneeded workers and infused with corruption, then a private monopoly may be preferable. Allocative efficiency potential depends on a variety of details, including the amount and type of government regulation.

Since Vouchers rely on the public sector to do the “Steering” and the private sector to do the “Rowing” the potential for achieving both allocative and cost efficiency goals are excellent.

Deregulation, approach 7, can lead to excellent allocative efficiency potential since both the private sector and the public sector are providing the service. However, since the public sector is providing a competing service, cost efficiency can suffer because of the lack of incentives for the public sector operation to be efficient, especially if the public operation is subsidized.

Finally, Publicization has the potential to achieve allocative efficiencies since the public sector involvement can take a variety of external effects into account, including economic development and pollution. Cost efficiency potential is good since the private sector is still very actively involved in the provision of service.

## **SOME DIFFICULT ISSUES**

There are many difficult issues that must be dealt with in the implementation of PPPs. In this section of the paper, a few of these issues will be discussed. This is not a comprehensive list. The focus is on problems that affect Greenfield and Brownfield concessions.

### **Length of the Contract Period**

The first issue concerns the length of the contract period. This is especially the case for Brownfield Concessions. The Chicago Skyway concession is for 99 years. The Indiana Toll Road contract period is 75 years. The Midway Airport concession was proposed to last for 99 years. Private companies prefer a longer payback period for two reasons. One is that the company has a longer period in which to earn revenues to offset the initial investment. Second, for tax purposes, the IRS treats such a long term lease as ownership of the facility. The company can then depreciate investments as if they own the facility. So, private sector risk is reduced the longer the length of the contract.

From a public sector standpoint, the longer the contract period, the more likely the facility will be able to generate higher up front payments. But there is a risk involved for longer contract periods. There are many societal, technological, and developmental changes that can occur in 99 years. Suppose a facility was leased in 1910, with a 99-year lease, coming due in 2009. The United States is fundamentally different in almost all aspects over those 99 years. A facility that was leased in 1910 could stand in the way of new development today. So could be the result in 2108, when a 99-year lease written today would be completed. The public sector may have new uses for the facility that may not be easily implemented if it is in private hands. This risk can be mitigated through the use of contract language that gives the public sector the right to purchase the lease at fair market value in the future. This, however, may lower the amount that firms would be willing to pay up front. Additionally, in the long term, technology or development patterns may make the facility obsolete. This could affect the private sector risk in the later years of the lease as well.

The private firm that is leasing the facility would prefer a longer contract period to a shorter one. However, the present value of earnings far in the future will be less than near-term earnings. Thus, the private profitability curve flattens out over very long contract periods. The present value of the future income stream can be greater, the greater the amount of cost efficiency savings from private ownership.

To the extent that the public sector can bargain away some of these savings, the initial lease payment will be larger and the time that it takes to recoup the lease payment will be longer.

To simplify the analysis, let us assume an initial lease payment with constant revenues and operations costs each year. Then let:

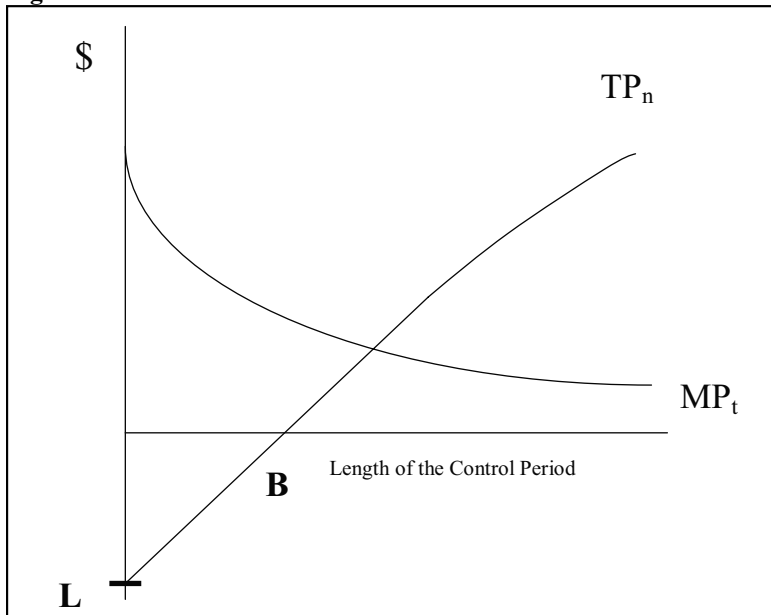
- L = the lease payment
- R = yearly revenues from the lease
- C<sub>f</sub> = yearly costs of operating the facility for the firm
- n = length of the contract period
- r = appropriate private sector discount factor
- t = time
- TP<sub>n</sub> = Present value of profit stream to be derived from operating the lease over n years

Then:

$$(1) \quad TP_n = \sum_{t=1}^n \frac{R - C_f}{(1+r)^t} - L$$

The total profit that accrues to the private company leasing the facility is a transfer from road users to the company. It can be considered the total social cost of the lease. This is not the social cost of operating the facility. Rather, it is the social cost of leasing the facility to a private company. This is shown in Figure 1 as TP<sub>n</sub>. As shown in the figure, the present value of the total profits to be derived from leasing the facility increases at a decreasing rate, reflecting the declining present value of profits over time. Point B in the figure is the breakeven number of years of the lease.

**Figure 1: Present Value of Future Private Sector Profits from Lease**



A reasonable approximation to the marginal profits accruing to the firm of leasing the facility for one more year is:

$$(2) \quad MP_t = \frac{R - C_f}{(1+r)^t}$$



This is shown in the figure as  $MP_t$ . Marginal profits, and thus the marginal social cost of leasing the facility, decline over time. In making decisions as to the total upfront lease payment, and the length of the contract period, the private sector firm would use this function in the process of negotiation.

The marginal social cost of a private firm operating the facility for one more year is equal to the marginal profits plus the yearly cost of operation.

So:

$$(3) \quad MSC_t = \frac{R}{(1+r)^t}$$

Society benefits from the operation of the facility. Initially, the public sector receives the lease payment  $L$  from the private company. This payment could include any cost efficiency gains that are bargained away from the private contractor. In addition, there is the continuation of an allocative efficiency gain from continual use of the facility. However, this allocative efficiency gain declines over time. The allocative efficiency gains are discounted by the appropriate social rate of discount and by a risk factor as alternative uses for the facility develop. Thus, the total public sector benefit curve declines over time as the length of the contract is extended. To simplify, assume the allocative efficiency gains are a constant amount over time, and that the social discount factor is the same as the private sector discount factor. Then:

$$(4) \quad SB_n = \sum_{t=1}^n \frac{AE}{(1+r+U)^t} + L$$

where:

$SB_n$  = Total Social Benefits from leasing the facility

$AE$  = Allocative Efficiency gains from the use of the facility

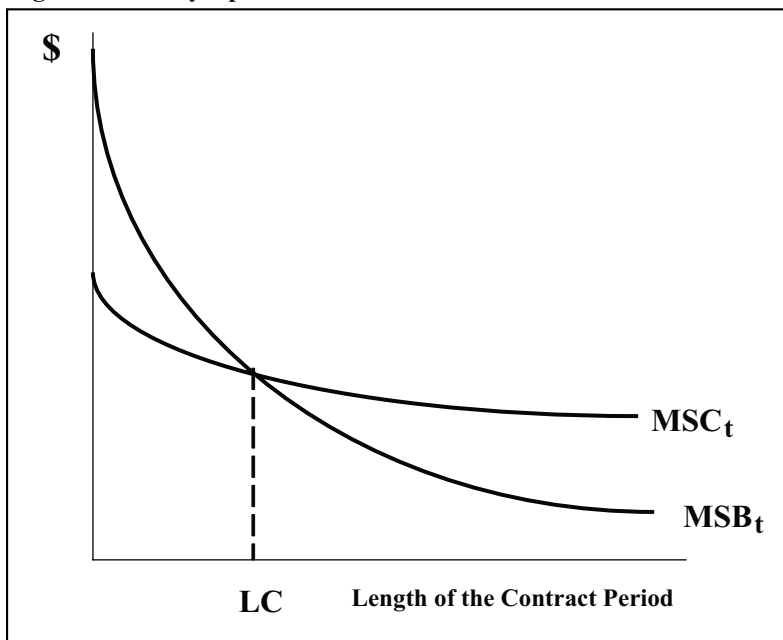
$U$  = Public sector risk factor

Then the marginal social benefits of leasing the facility are given by:

$$(5) \quad MSB_t = \frac{AE}{(1+r+U)^t}$$

Marginal social benefits and costs are shown in Figure 2. Initially, allocative efficiency benefits from the use of the facility are greater than the private sector costs of operation of the facility. Otherwise, the facility would be abandoned. Both benefits and costs of operation decline the longer the facility is operated. This is shown as the declining curves in the figure. However, as displayed in the figure,  $MSB_t$  declines at a faster rate than  $MSC_t$ , reflecting the public sector risk factor. If the public sector risk factor is very low, the two functions may not intersect for many if not hundreds of years. In that case, the facility is best sold to the private sector as an asset sale.

The optimal length of the contract is shown as the intersection of these two lines,  $LC$ . If the length of the contract is less than this, it would be advantageous to expand the contract length. Contract periods greater than  $LC$  would involve a social loss. Depending on the public sector risk factor, contract periods of 75 – 99 years may not be socially desirable. For example, PIROG has argued that contracts should be no longer than 30 years (Baxandall 2007). While this may be too short for some concessions to break even, it indicates that the longer contract periods may not be beneficial. Ortiz and Buxbaum (2008) note that in other countries, concession agreements are typically for 30–40 years.

**Figure 2: Socially Optimal Contract Period**

The Chicago Skyway concession agreement allows for toll increases after the first five years. The increases can be at the highest of 2% per annum, increase in the CPI or increase in nominal GDP (Enright 2006). Each of these possible toll increases results in a different revenue stream for the private contractor and thus a different marginal social cost function. This is shown in Figure 3. In the figure, it is assumed that nominal GDP growth is greater than the CPI, which is greater than 2%. The greater the toll increases allowed, the greater the total revenues generated and the shorter the optimal contract period. If traffic grows at faster rates, thus generating more revenues, then the optimal length of the contract would be less. However, increases in traffic may also result in increased operating costs, thus changing the cost function.

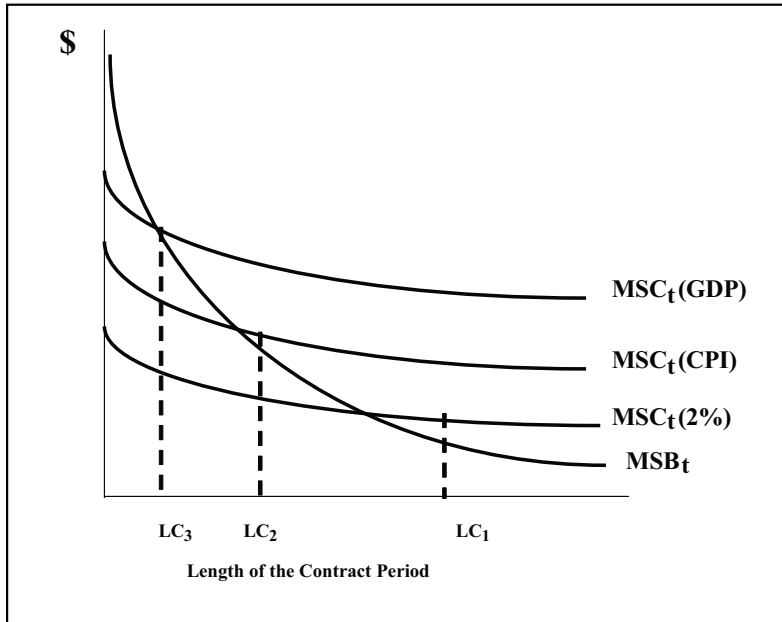
This analysis assumes that public sector decision makers attempt to maximize social welfare. This may not always be the case. Maskin and Tirole (2008) consider situations when government officials have preferences that differ from those of a social welfare maximizer, such as preference for pork barrel projects. They develop a model to analyze the implications of these situations and suggest ways in which the negative effects on social welfare can be minimized.

### Use of Funds from Initial Lease Payment

If a Greenfield Concession is implemented, the initial costs of the project are utilized to design and build the planned facility. Brownfield Concessions are different. A large upfront lease payment is made to the government entity by the private company. The government entity could use the proceeds for other transportation improvements or to pay for general government. There is a tendency to view this large payment as a windfall to be used to balance budgets, pay down debt, or fund new government services.

In the case of the Chicago Skyway, proceeds were used to repay project debt, create reserve accounts, and provide for programs unrelated to transportation. The Indiana Toll Road proceeds were completely dedicated to funding a 10-year transportation capital program (FHWA 2009).

The lease payment must be paid back to the private company over time by users of the facility. If it is used to finance transportation improvements, then users of the facility help to finance improvements elsewhere in the system. On the other hand, if the proceeds are used for general government, then users of the facility in the future will pay for general government today. This is an intergenerational transfer

**Figure 3: Toll Increases and Optimal Length of the Contract Period**

that may not be socially desirable, especially since users of the facility years hence have no say in the matter.

### Non-Compete Provisions

Several of the contracts have non-compete provisions, giving the private sector contractor a monopoly over the provision of the service. The inclusion of these provisions is a two-edged sword. On the one hand, some of the market power that is transferred to private hands can be bargained away and may result in larger upfront payments, especially for Brownfield Concessions. On the other hand, such market power can lead to much higher tolls over time. Thus, it may be necessary to counter such provisions with strict price regulation, which carries a whole host of problems which are well documented in the public utility literature.

In the case of the Chicago Skyway, alternative routes currently exist, but are very circuitous. The existence of these routes would tend to keep a cap on toll increases. There are several alternatives to Midway Airport, including O'Hare, Mitchell Airport in Milwaukee, and Gary Airport, which currently has no commercial service, but could host such service in the future. The Peotone Airport, which has been a source of contention for many years, could also serve as an alternative. Thus, there exists much potential competition for a Midway Airport concession outside the city of Chicago. There are slower, but more scenic alternatives to the Indiana Toll Road, so competition already exists. Thus, in these three cases, non-compete provisions would have little or no practical effect.

### Facilities Requiring Subsidy

Public transit offers unique problems with regard to PPPs. These facilities usually require subsidy, so it would not seem feasible to ask private operators to engage in a long-term concession and pay an upfront fee. After all, who would pay to operate a money-losing facility? The usual approaches in public transit are competitive contracting or vouchers, in which the private operator receives compensation from the public transit provider to operate routes or facilities.

One approach that has been used in the United Kingdom is an “Availability Payment.” The private company is responsible for one or more functions of design, build, finance, operate and maintain a “Greenfield” project. In return, the public agency provides a monthly payment to the company during the operations and maintenance phase of the project. In the United States, this approach has been used in the Port of Miami truck tunnel project. The FTA has selected three cities (Denver, Houston, and Bay Area) to implement such PPP projects (Fishman 2009).

There are possibilities for other forms of PPPs in public transit as well. One alternative is for the private company to pay an upfront fee to the public transit provider to operate an existing route or facility for a certain number of years. The private operator could either control the fares charged with government vouchers for low income riders, receive an agreed upon shadow fare for each customer served, or receive an availability payment. A shadow fare is a payment to the private operator usually on a per rider basis as compensation for providing the service. Typically, it would exceed the actual fare collected. Shadow fares provide an incentive to increase ridership.

Such approaches have not been tried in the United States, but may offer many of the benefits of PPPs to transit.

## CONCLUSIONS

Public-private partnerships offer the prospect of achieving desired social benefits of transportation in the most efficient manner possible. The planning, coordination and possibly subsidy provided by the public sector is combined with the incentives of the free market. There are a variety of approaches to PPPs that have been implemented either in the United States or in other countries. Most offer outstanding prospects of achieving both allocative and cost efficiency goals. The most problematic approach is the “Brownfield Concession,” which is most well known today. However, with carefully crafted agreements, shorter contract periods, and upfront payments that are used to enhance transportation, such an approach can also achieve social goals at lowest cost.

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**Anthony M. Pagano** is an associate professor of Management and director of the Center for Supply Chain Management and Logistics at the University of Illinois at Chicago. In 2006, he served as president of the Transportation Research Forum. He was also co-general editor and co-founder of the *Journal of the Transportation Research Forum*. He is a Fulbright Scholar, having taught and researched in Panama in 2010. His Ph.D. is in economics from the Pennsylvania State University.