An aerial, black and white photograph of a city, likely New York City, showing a dense grid of buildings and streets. A prominent, large, classical-style building with a dome is visible on the left side. The image is slightly faded and has a grainy texture. A semi-transparent grey rectangular box with a black border is overlaid on the right side of the image, containing the title text.

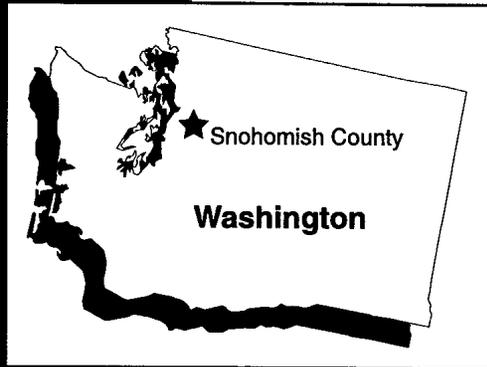
**Cases on Revenue Generated  
by Transit Agencies**

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# **Turnkey Procurement**

**Community Transit  
Snohomish County, Washington**

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## Community Transit

### Background

Transit agencies are continually seeking new funding sources for capital improvements, whether for vehicle purchases or facility development. One approach often used by other industries to develop facilities both domestically and internationally is the turnkey or superturnkey method of procurement. The superturnkey method is very similar to the turnkey but includes operation and maintenance of the facility in addition to design and construction. This method is common because it saves time and costs.

Traditional design-bid-build procurement involves issuing separate requests for proposals and selecting independent contractors for each stage of a project. For example, to build an operations base using traditional procurement, a transit agency must procure a designer and a construction company in two separate steps.

The communication between the designer and the builder in traditional procurements is very limited. In design-bid-build procurement, the entire design must be completed before the builder is selected and construction can begin. This timing leads to a lack of

### Agency Profile

Service Area	Snohomish County, WA
Modes	Bus, Demand Response
FY96 Operating Budget	\$38 million
FY96 Capital Budget	\$19.2 million
Annual Ridership	
Bus	6.8 million
Demand Response	146,092
Revenue Vehicle Miles	
Bus	6 million
Demand Response	1.3 million
Fares	
Bus	\$.80
Demand Response	\$.80

communication between the designer and the builder, which results in frequent change orders during construction.

In a design-build procurement for a similar project, the designer and builder propose as a team and there is one proposal selection process. After choosing a project team, the architect begins the design process. With the construction company involved in the design process,



input, comments, and changes to the design occur early in the design phase, thus reducing the number of expensive change orders necessary once construction begins. In addition to improvements in communication among the project team, the construction process is sped up because there is no second proposal selection process. Once designs for early components of the facility are completed, construction can begin while later components are being designed.

In this case study, we examine the turnkey construction of a bus operations base in Snohomish County, Washington. Included in other sections of this casebook are one other turnkey project and two superturnkey projects. Information on where to find these cases is in the last section of this case entitled "Contact Information."

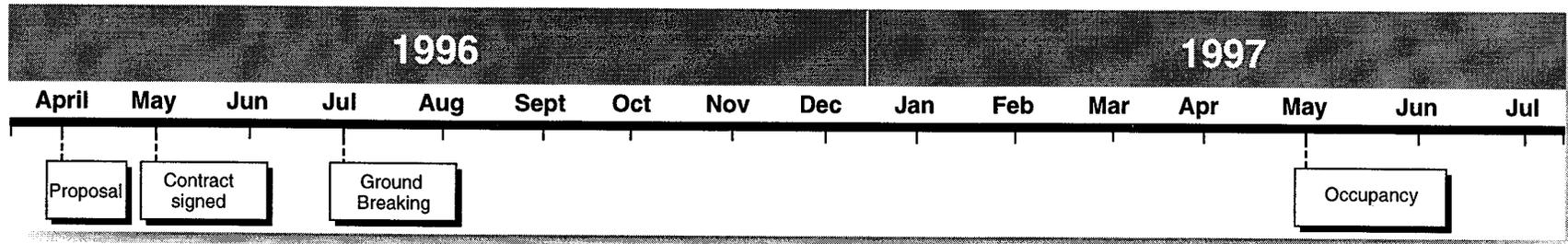
## Case Background

Community Transit owns 239 buses, 43 paratransit vehicles, and 173 vanpool vans which provide local, paratransit, and ridesharing services within Snohomish County, Washington, and express bus service to Seattle, Washington. All these services together transport 39% of the commuters in Snohomish County into Seattle.

Community Transit is a fast-growing transit organization. In 1996, Community Transit increased local bus service in Snohomish County by 12%; this new service led to a 30% growth in ridership. In 1997, Community Transit plans to continue to expand local bus service by 16%. In order to provide this new service, Community Transit has purchased many new buses.

Community Transit's other locally operated modes have also grown. For example, vanpooling is very prevalent in Snohomish County. In the last year, Community Transit purchased 86 new vanpool vehicles, almost doubling the number of vehicles owned. In the same period, vanpool ridership increased by over 75%. The new buses, vans, and paratransit vehicles necessary to provide these expanded services have caused Community Transit to outgrow its current bus operations base.

Community Transit's express commuter service from Snohomish County to Seattle is provided by a private contractor. In June 1997 the lease expired for the contractor's rented operations base. Since the rented express bus base was unavailable for future commuter bus service, Community Transit also needed room to house and maintain the commuter bus fleet.



## Implementation

To house the buses required by its growing local service and meet the needs of its commuter service contractor, Community Transit first thought to expand its current operations base. In 1995, Community Transit tried to buy land adjacent to this base but was unsuccessful. After this setback, the agency decided to



Ground Breaking in July 1996

purchase land to build a new bus base for the local services and convert the existing base to house the express commuter service. Building a new bus operations base required a land search, design, construction, and related equipment procurements (*e.g.*, paintbooth, bus lifts). This process would take between three and five years. Community Transit became concerned with this time frame because the commuter service needed to move out of the rented bus base within a year and a half (by June 1997).

Community Transit hired a real estate firm to search for a site for the new base. A suitable site would be 15 to 20 acres with the correct zoning. The site must be located near freeways and/or major arterials. The most appropriate site that the firm found was owned by the Quadrant Corporation. When Community Transit approached Quadrant to discuss the purchase of the land, Quadrant proposed to sell Community Transit the land plus design and build the required base, offices, and maintenance facilities. While Community Transit had not originally considered a turnkey approach, Quadrant's proposal convinced it that design-build would be an ideal procurement method for this base construction. Turnkey addressed all of Community Transit's concerns: fast completion, site selection, and low cost.

Community Transit's Board proceeded to amend its procurement regulations to allow for design-build contracts.

In April 1996, Quadrant submitted a proposal for the base, offices, and maintenance facilities based on a further 32% service expansion. Before Community Transit agreed to close the deal, it required Quadrant to obtain all necessary building permits so that construction could begin as soon as the property was purchased. By May 1996, Community Transit had signed a contract with the Quadrant Corporation for the land purchase, base design, and project construction; ground was broken on July 1. The completion phases overlapped: early phases of work were designed, and during their construction, later phases were designed. Community Transit occupied the base one month ahead of schedule on May 1, 1997.

### **Program Structure**

This design-build project was funded by a local sales tax and matching Motor Vehicle Excise Tax from the State of Washington (no federal funds were used). The contract guaranteed that the maximum amount charged for the entire project would be \$19 million. In the recent past, Community Transit collected more in



The Merrill Creek Operating Base is 22.5 acres with an 87,000 square foot maintenance facility; human resources, safety and training offices; and dispatch facility. There is parking for 400 buses, a bus wash building, and a bus fueling facility.

total revenues than it experienced in operating costs. This surplus was used to build a reserve fund for vehicle replacement and facility expansion.

Quadrant's design plans were examined and discussed by both Community Transit and the construction firm on Quadrant's team. As a result of this review, changes were made early in the design process which reduced construction time and costs. Even with minor scope increases, the cooperative process improved the final facility at minimal cost. The total project cost was \$19 million including the land purchase price of \$5 million, half of the estimated project cost if built through traditional procurement.

## Concerns with Turnkey

Community Transit had three main concerns with the design-build contract:

- how to adhere to federal regulations such as minimum wage rates in a contract that was entirely locally funded,
- how to monitor costs incurred by the prime contractor and any subcontractors, and
- how to manage risk to the transit agency.

All these issues were addressed successfully. First, Quadrant willingly agreed to include wage and other

federal minimums in the contract terms. Second, Community Transit hired an independent third party consultant to monitor the costs of the design-build project. Third, unlike traditional procurement where most of the project risk falls on the transit agency, in this project risk was shared by all parties. Community Transit, the contractor, and all the subcontractors had an equal stake in getting the job done well because they were all part of the same project team.

The turnkey cost savings were significant. In addition, because Community Transit had not selected Quadrant based on a low-bid cost-plus procurement there was less pressure to maximize Quadrant's profit. The result was a very friendly builder-owner relationship in which Quadrant worked hard to negotiate the best deals from the subcontractors, since it benefited from the cost savings through increased profits.

### Commuter Express Bus Service Effects

Soon after the commuter base lease terminates, the express bus service contract will expire. The original RFP for commuter service required the contractor to provide its own bus operations base. This requirement limited the competition to one bidder who won the contract. In the upcoming RFP, contractors will be allowed to use Community Transit's old bus operations facility. In addition to housing the commuter service, the old base will also provide storage for gasoline powered nonrevenue service vehicles and vanpool vehicles. The new base will only be used by diesel powered vehicles. By being able to supply a base for the contractor, Community Transit has lowered costs in two ways. First, the private contractor no longer has to pay rent on its own operation and maintenance facility, and this cost savings is passed through to Community Transit. Second, a significant increase has occurred in the number of bids received for the provision of express service: five bids as opposed to the one last time.

## Lessons Learned

Community Transit is pleased with the project results and plans to use the design-build process in future procurements. There are three important savings which result from a turnkey project: time, cost, and risk.

- **Time.** A single procurement for simultaneous design and construction reduced the expected product completion time from the 3 to 5 years typical of traditional procurement to 18 months.
- **Cost.** Money and time were saved because of fewer construction claims and change orders (there were none). Even with scope increases, the cooperative process improved the final facility at a

minimal cost. The total project cost was \$19 million, half of the cost of a similar base built through traditional procurement.

- **Risk.** Unlike traditional procurement where most of the project risk falls on the transit agency, in this project, risk was shared by all parties.



### Suggestions for Future Turnkey Projects

When Community Transit originally negotiated the project price with Quadrant, the base design was only 10% completed. At this time, Quadrant gave Community Transit a preliminary project budget of \$14 million. The Community Transit Board subsequently gave the transit agency permission to negotiate for the project up to this maximum. However, because of the changes necessary during the turnkey discussions among Community Transit, the designer, and the builder, Quadrant revised its contract price proposal when the design was 30%

complete and set the final project budget at \$19 million. Since Community Transit had already asked its board for a maximum amount of \$14 million, it was hard to justify asking for an additional \$5 million. Although it was ultimately able to obtain approval for the additional funds, Community Transit felt that it could have avoided this problem by waiting to negotiate the project budget until later in the design phase.

Finally, while design-build allows for greater flexibility and communication, a transit agency needs to realize that it cannot spend infinite amounts of time designing and redesigning the project. Good input and information are essential, but a transit agency must realize that it cannot spend much time deliberating; design-build necessitates making decisions more quickly than usual.



Inside the bus maintenance facility

## Contact Information

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Community Transit  
425-348-7100

Case: "Public Private Partnership For CNG Fueling  
Station and Bus Purchases"  
Metropolitan Atlanta Rapid Transit Authority  
Perry Boulevard Base CNG Refueling Facility  
Peter Bruno and Charles McAllister  
404-848-5050

Case: "Public Private Partnership For CNG Fueling  
Station and Bus Purchases"  
Central New York Regional Transportation Authority  
CNG Refueling Facility  
Steve Share and John Clare  
315-442-3300

Case: "Creative Use of Federal Funds"  
Los Angeles County Metropolitan Transportation  
Authority  
Union Station Gateway Center  
Dennis Newjahr  
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# **Advance Construction Authority**

**Massachusetts Bay Transportation Authority  
Boston, Massachusetts**

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# Massachusetts Bay Transportation Authority

## Background

As the useful life of facilities comes to an end or as technological changes render facilities obsolete, transit agencies will need to rehabilitate or replace these sites. In the current state of uncertain funding, new approaches need to be designed to finance these major construction projects. In this case study, we examine how the Massachusetts Bay Transportation Authority (MBTA) applied Advance Construction Authority to finance the rebuilding of its main commuter rail maintenance facility.<sup>1</sup>

MBTA provides transit service to metropolitan Boston, Massachusetts. The agency operates bus, paratransit, light rail, heavy rail, and commuter rail service for residents. As with most large, northeastern cities, the transit system in Boston is very old, dating back to the 19<sup>th</sup> century, when it was run by private companies. The MBTA's main commuter rail maintenance facility, the Boston Engine Terminal, is on a site that has

## Agency Profile

Service Area	Greater Boston and Providence, RI
Modes	Bus, Trolley Bus, Heavy, Light, and Commuter Rail, Ferry, Demand Response
FY96 Operating Budget	\$753.2 million
FY96 Capital Budget	\$589.2 million
Annual Ridership	
Bus and Trolley Bus	102.3 million
Heavy Rail	192.8 million
Light Rail	69 million
Commuter Rail	27 million
Ferry	68,000
Demand Response	93,000
Revenue Vehicle Miles	
Bus and Trolley Bus	26.1 million
Heavy Rail	25.7 million
Light Rail	4.1 million
Commuter Rail	16.2 million
Ferry	not available
Demand Response	6.4 million
Fares	
Bus and Trolley Bus	\$1.00
Heavy Rail	\$2.00
Light Rail	\$0.85
Commuter Rail	\$1.00
Ferry	\$4.00
Demand Response	\$1.00

been used for rail operations since the 1870s. The current facilities have been in use since 1929 when they serviced freight steam engines for the Boston and Maine Railroad. Today, the antiquated facility needs to be completely rebuilt to service commuter rail rolling stock more cost-effectively and to benefit from modern technology.

At the Boston Engine Terminal site, all overhaul and heavy repair work for the fleet is performed under contract by AMTRAK. AMTRAK also performs routine maintenance for portions of the northern suburbs' rolling stock. The facilities at the Boston Engine Terminal are badly in need of renovation:

- **Round House.** Light maintenance work is performed in this wood building built in 1929; the equipment is 40 to 50 years old, obsolete, and unreliable.
- **Diesel House.** This facility, built in 1947, has eight locomotive repair bays. It is used for daily service inspection, but with 2 bays per track, only a small part of each train can be inspected at any particular time.
- **Coach House.** Built in 1984, the Coach House is used for daily inspection and cleaning of the coaches. Locomotives are sanded and fueled outside. The structure is not large enough to house an entire MBTA train set (one locomotive and 6 passenger cars).

- **Budd House.** The Budd House, built in 1956, was scheduled to be closed, but because of the shortage of space, the structure has remained open for daily service and inspection.
- **Administrative office.** This building was built in 1929.

The age, technology, and current layout of the facility has lead to some significant problems. Space is a major problem for this site. First, due to the limited repair capabilities, rolling stock must be taken out of service for extended periods of time while waiting for repairs or routine inspections. Second, there is no place on the site, as it is currently designed, to store this equipment once it leaves service. The inefficient design of the yard makes train movement difficult, particularly due to the stub-ended tracks. With commuter rail ridership growing in Boston, taking stock out of service is increasingly problematic.

MBTA also needs to provide a resolution to environmental issues (specifically to address groundwater contamination by engine oil, grease, and other fluids), improve worker safety, and increase security to protect rolling stock.

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**"Under Advance Construction Authority, MBTA could fund 80% of principal and interest payments out of federal grant funds expected to be received over the next 19 years."**

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## Implementation

Once the Boston Engine Terminal project design was complete, the MBTA staff discussed several alternatives for contracting and financing the project. Traditionally, in large transit projects, each year of construction was contracted separately. However, MBTA's previous experience with large projects and separate annual contracts had resulted in significant quality control problems and cost overruns. As a result, MBTA preferred to establish one large contract for the work.

However, in order to establish one contract for the entire construction project, MBTA needed to be able to identify all of the funds required to complete the project. The total project cost of \$235 million made this impossible without some financing mechanism. MBTA staff explored several possible alternatives:

- **Private construction and ownership, with the facilities leased back to MBTA.** Under this approach, MBTA would contract with a private firm to complete the reconstruction. MBTA would finance construction through lease payments to the firm.
- **Letter of no prejudice from FTA (i.e., preaward authority).** Under this approach, FTA would commit future MBTA funding to repayment of principal on a bond issue.
- **Advance Construction Authority.** This approach is similar to pre-award authority, but would allow repayment of both principal and interest from FTA grant funds.

MBTA did not investigate a full funding grant agreement since it knew that the project's financing term would exceed the five-year duration of FTA's authorizing legislation.

MBTA investigated the private approach and determined that the cost would likely be prohibitive. As a result, they narrowed their options to the two involving federal funding. Because MBTA wished to begin construction as quickly as possible, it requested technical assistance from the FTA Region I office in evaluating the remaining options.

The regional FTA staff and legislative experts in Washington analyzed federal transit policies and programs to help MBTA make a determination of the best approach. MBTA stressed that the priority was to complete the projects in the shortest possible time using federal funds. Because the Advance Construction Authority allowed FTA funds to be used for repayment of interest in addition to principal on a bond issue, FTA recommended this approach.

Under Advance Construction Authority, MBTA could fund 80% of principal and interest payments out of federal grant funds expected to be received over the next 19 years. MBTA felt that this recommendation met the financing and construction needs and began to prepare an Advance Construction Authority request to FTA.

### The Advance Construction Authority Proposal

In September 1994, MBTA submitted its proposal to the FTA for Advance Construction Authority to fund the reconstruction of the Boston Engine Terminal. The

proposal included the project description, schedule, financing plan, interim programs, environmental impact, and required paper work for regular grant requests.

In the project description section, MBTA stated that it needed to completely replace its Boston Engine Terminal facility because the age, technology, and layout of the current site had led to some significant problems. The description detailed the technology and efficiency problems described earlier.

Through the Boston Engine Terminal reconstruction, MBTA must also resolve environmental issues, specifically contaminated groundwater remediation necessitated by runoff from engine oil, grease, and other fluids. It also needs to improve worker safety and increase security to protect the rolling stock.

The proposal detailed the project construction schedule. Between April 1994 and November 1997, MBTA expected all construction of the facility to take

place. Another two years will be necessary to complete the groundwater remediation work.

One of the most important parts of the proposal was the description of the financing plan. MBTA expected to finance the project through Section 3 fixed guideway modernization capital funds. MBTA annually receives nearly \$43 million of these funds. For 19 years, MBTA will use \$16 million per year of this money (and the required \$4 million local match) to pay for the Boston Engine Terminal reconstruction project. The remaining \$27 million of the annual grant will be used to maintain the rest of the rail transit system. Even though the entire \$235 million cost will be experienced in the first six years, MBTA will be able to pay for the project over 19 years.

The proposal also discussed the interim measures needed to run the commuter rail system during Boston Engine Terminal reconstruction and the environmental impact of the project and included all necessary grant forms.

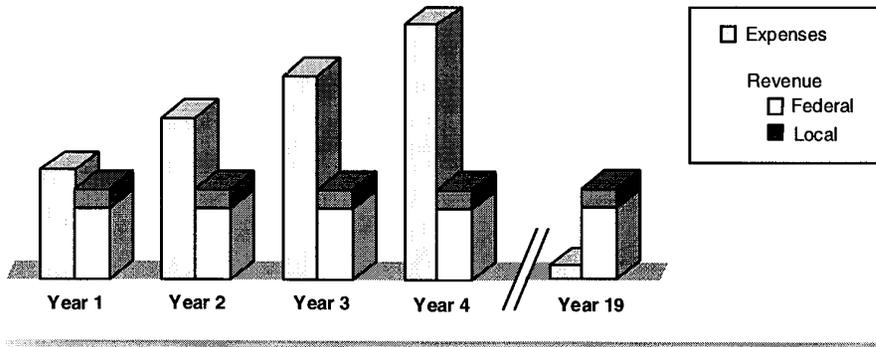
## Program Structure

Pursuant to the Federal Transit Act, MBTA must resubmit proposals to FTA for Advance Construction Authority with every subsequent transit authorizing legislation (*i.e.*, ISTEA, NEXTEA, *etc.*). In addition, MBTA must apply each year for Section 3 Fixed Guideway Modernization funds.

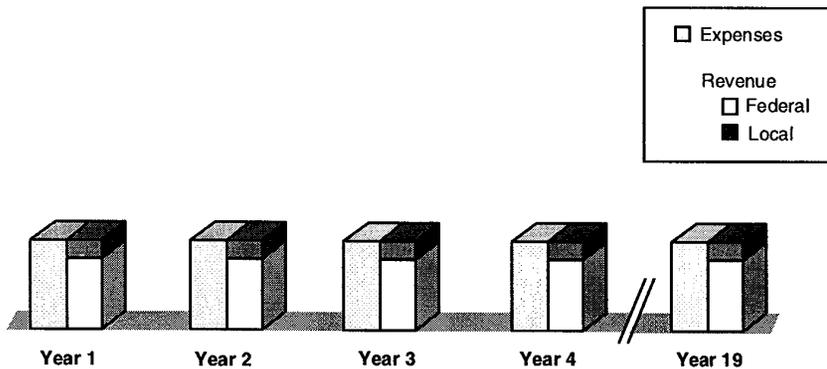
The flow of funds under Advance Construction Authority is quite complex. MBTA is invoiced by the contractor. It pays for the local share and submits receipts for reimbursement of the federal share. Because



**Advance Construction Authority**



**Traditional Financing**



Graphical representation of the difference between traditional and Advance Construction Authority financing of the Boston Engine Terminal project.

each year's invoices exceed the total local and federal share, MBTA issues short-term debt to cover the remainder. Twice a year, MBTA issues long-term general obligation bonds to retire this short-term debt. These bonds are not specific to the Boston Engine Terminal project but are for the entire capital program.

**Interest Expenses**

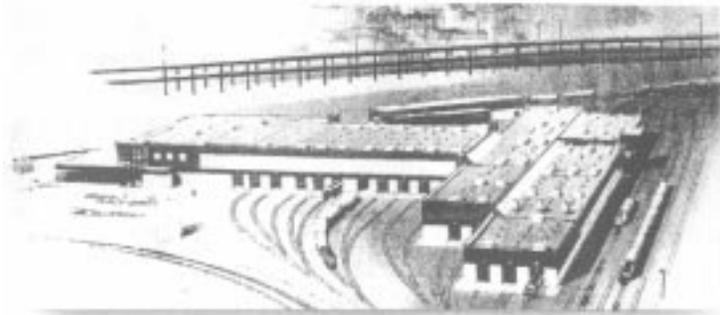
In calculating the federal share of interest expenses, MBTA employs a weighted average. MBTA tracks the progress payments from FTA and ties them to specific bond issues.

**Lessons Learned**

MBTA notes several key advantages to Advance Construction Authority over traditional funding methods for large, expensive projects:

- expenses can be incurred immediately,
- construction can be consolidated into one contract, and
- 80% of the bond interest for all expenses incurred above the FTA allocation are reimbursable by FTA.

With Advance Construction Authority, a transit agency can spend



Rendering of the future Boston Engine Terminal

the money necessary for a major contract immediately. Thus for projects that exceed an agency's annual FTA capital allocation, a transit agency can build them immediately without having to wait to collect multiple years of allocations and realize the benefits of the project sooner. If MBTA had to wait until it had cash on hand for the \$235 million Boston Engine Terminal renovation, the facility would have been out of service for 19 years. Under Advance Construction Authority, the Boston Engine Terminal is being rebuilt in 6 years, but the financing is accomplished through 19 years of debt service repayment.

### Project Financing Timeline

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
<b>Loan 1</b>	\$11,323,738								
	849,280								
	12,173,018								
<b>Loan 2</b>		\$54,747,233	\$39,127,012	\$22,257,173	\$4,037,747				
		4,379,779	3,130,161	1,780,574	323,020				
		59,127,012	42,257,173	24,037,747	4,360,767				
<b>Loan 3</b>			\$55,960,465	\$60,437,302	\$65,272,286	\$54,854,836	\$39,243,223	\$22,382,681	\$4,173,295
			4,476,837	4,834,964	5,221,783	4,388,387	3,139,458	1,790,614	333,864
			60,437,302	65,272,266	70,494,069	59,243,223	42,382,681	24,173,295	4,507,159
<b>Loan 4</b>				\$55,960,465	\$60,437,302	\$65,272,286	\$70,494,069	\$76,133,595	\$82,224,283
				4,476,837	4,834,964	5,221,783	5,639,526	6,090,688	6,577,943
				60,437,302	65,272,266	70,494,069	76,133,595	82,224,283	88,802,226
<b>Loan 5</b>					\$21,939,453	\$23,694,609	\$25,590,178	\$27,637,392	\$29,848,383
					1,755,156	1,895,569	2,047,214	2,210,991	2,367,671
					23,694,609	25,590,178	27,637,392	29,848,383	32,216,054
<b>Loan 6</b>						\$7,241,665	\$7,820,998	\$8,446,678	\$9,122,412
						579,333	625,680	675,734	729,793
						7,820,998	8,446,678	9,122,412	9,852,205

Legend	
	Principal
	Interest
	Principal and Capitalized Interest



Overall, MBTA is very pleased with its use of the Advance Construction Authority program. FTA has been very cooperative by streamlining the administrative process. The Boston Engine Terminal project will be completed by 2000 and provide safe, efficient, and cost-effective service to a secure commuter rail fleet for the Boston metropolitan area.

### **Contact information**

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### **Endnotes**

- 1 Advance Construction Authority is available for use with funds under Sections 3 and 9 of the Federal Transit Act.

# **Cross Border Leasing**

**King County Department of Transportation  
Seattle, Washington**

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## King County Department of Transportation

### Background

Buses, trains, other vehicles, facilities, and equipment all lose value over time as they become old and obsolete. The United States and other federal governments realize this loss in value of the assets to businesses by allowing an income tax deduction for depreciation. Public transit agencies, which pay no income taxes, cannot directly realize this tax benefit from depreciating assets.

For many years, the United States tax code permitted safe harbor leasing to rectify this inequity between private and public corporations. Through this mechanism, a transit agency arranged for a private-sector third party to purchase transit vehicles and receive the depreciation tax benefit. The third party then leased the vehicles back to the transit agency, passing through some of this tax benefit. The end result was that the agency acquired new vehicles for a cost lower than their anticipated direct purchase price. This lease structure was more prevalent for rail car and locomotive purchases than for buses.

### Agency Profile

Service Area	King County, WA
Modes	Bus, Demand Response
FY96 Operating Budget	\$253.1 million
FY96 Capital Budget	\$103.8 million
Annual Ridership	
Bus	76.4 million
Demand Response	686,292
Revenue Vehicle Miles	
Bus	39.4 million
Demand Response	not available
Fares	
Bus	\$0.85
Demand Response	\$0.50

Through safe harbor leasing, the United States tax code provided a type of financial assistance to transit on top of FTA funding. When, in the mid-1980s, the government eliminated this form of subsidy for transit agencies, creative agencies continued to use this leasing arrangement with third-party foreign investors in Denmark, France, Germany, Japan, and Sweden through cross border leases.

Under a cross border lease, foreign investors own the assets and receive the tax benefits for depreciation in their home country. A transit agency benefits from this leasing structure because the foreign investor shares its tax benefit with the transit agency. These complex transactions require knowledgeable legal advisors to guide the transit agency in arranging the most profitable lease. Although the high cost of these complex transactions generally requires a minimum transaction size of \$20 million dollars, smaller agencies can pool assets to make a transaction possible.

**Case Background**

The transit division of the King County Department of Transportation provides bus services for metropolitan Seattle, Washington. For a 1991 purchase of 80 new buses, the agency's financial advisor recommended a cross border lease to lower the vehicles' cost. The agency was pleased with savings, and the King County Department of Transportation decided to use cross border leasing for subsequent purchases.

In 1996 and 1997, King County will acquire 360 buses for about \$89.7 million. A cross border lease was designed in two phases:

- 124 buses delivered in 1996 with a value of \$32.9 million and

- 232 buses to be delivered in 1997 with a value of \$61.4 million.

Four buses were not included in this transaction because they arrived before the cross border leasing deal was closed.

At the outset, King County expected to save 4.5% (or \$4.24 million) off the original purchase price through this cross border lease.

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**"Although the high cost of these complex transactions generally allows for a minimum transaction size of \$20 million dollars, smaller agencies can pool assets to make a transaction possible."**

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**Implementation**

Since the transit system is part of the county government, county council approval for the transaction was required, and a motion was passed in August 1996. Subsequently, King County discovered that the state statute requires

the county to pass an ordinance in order to complete the dollar investment portion of the lease structure. This ordinance is in the processed of being passed.

**The Request for Proposal Process**

In February of 1996, the county issued a request for proposals (RFP) to retain a lease arranger. The services provided by the lease arranger included

- explaining to King County the tax benefits to be realized,

- developing a lease strategy,
- developing and executing a marketing plan for the lease,
- preparing the terms and conditions of the lease,
- designing and issuing the cross border lease RFP,
- providing a written evaluation, including financial analysis and suggestions to King County on all proposals received,
- advising King County in negotiations with the lessor, and
- producing all documents to complete the lease.

### Lease Arranger Duties

The winning consortium was led by Capstar Partners, Incorporated, and explained the mechanics



One of the buses that participated in the cross border lease.

and risks of a cross border lease to King County. The lease arranger examined the market for cross border bus leases and concluded that the Japanese market was the only viable market for buses. European and North American investors were more interested in longer term assets such as rail cars.

On behalf of King County, Capstar drafted a letter for King County to send to the FTA regional office requesting approval for a cross border lease. After resolving questions through Capstar, the Office of Chief Council at FTA headquarters in Washington, DC, approved the lease. King County feels that as a rule, FTA accepts cross border lease deals as long as the net benefit is greater than the transaction cost.

### Program Structure

The King County Department of Transportation purchased 124 buses in 1996 and 232 buses in 1997 using FTA Section 9 funds. In two separate transactions (one for the vehicles received in 1996 and one for the vehicles received in 1997), it sold these buses to Japanese investors. Every month for eleven months, King County closed a tranche, meaning the county accepted delivery of a group of new buses and transferred the title of the buses to the Japanese investors, who then leased the buses back to King County. Finally, King County purchased securities (for example, certificates of deposit [CDs], U.S. treasury notes, or municipal bonds) with the sale proceeds to secure the lease payments. Throughout the lease period, King County will retain use and control of the vehicles.

### Japanese Tax Law Requirements

Japanese tax law allows an eight-year lease, and requires the lease to be structured in tranches. Under Japanese tax law the investors can claim tax deductions for

- **Depreciation of the buses.** The buses are depreciated under the declining balance method over six years.
- **Transaction expenses.** Capstar's fee is paid for up-front by the Japanese investors but is actually passed on to the transit agency through lease payments. Advisory services are deductible as part of the transaction expenses.
- **Interest paid by the lessor to borrow funds to purchase the buses.** Japanese investors contribute equity for a specific percentage of the vehicle cost (34.5% for this particular transaction) into a specially created, equity investing corporation. This corporation then secures a loan for the remainder of the vehicle purchase price using the buses as collateral. These lease payments

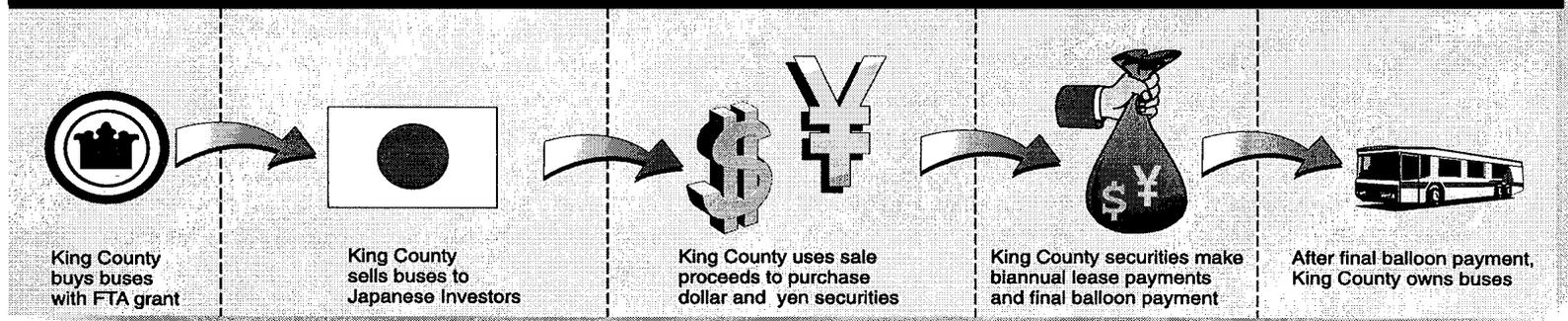
exactly match the debt service on the investors' loan. The interest on this loan is tax deductible for the Japanese investors.

Each of these tax deductions is being taken advantage of in King County's lease arrangement. Through the lease payments, the Japanese investors share the tax benefits with King County.

### Washington State Banking Requirements

Normally for this type of lease, the transit agency would purchase the yen securities to guarantee the lease payments in a Japanese bank, however, according to the State of Washington's statute, the county can only deposit money into banks in Washington State. Thus for the yen portion of the transaction, King County deposits dollars in a local bank (Seafirst - a bank with which the county already has a relationship), which Seafirst uses to purchase fixed-rate yen CDs from its parent bank, the Bank of America in Tokyo. While it has not yet bought securities for the dollar portion of the lease, King County expects to use bank notes, U.S. treasury or municipal bonds, or other low-risk paper.

### Cross Border Lease Transaction Structure



### Leasehold Arrangements

Cross border leases work well for rolling stock, but separate transactions called leaseholds exist for facilities. Agencies often own their facilities (buildings, parking lots, etc.) and can realize a 6-10% return on them through a leasehold structure. These leases are for long-lived assets unencumbered by liens with a useful life of 25 years or more.

In a leasehold transaction, the transit agency leases an asset to a trust company lessor for up to 80% of the remaining useful life of the asset. The agency then subleases back the facility from the trust. Depreciation tax deductions are passed through the sublease from the trust company to the transit agency.

#### Financial Structure

The trust company pays the entire lease up-front to the transit agency through a combination of debt and equity. The transit agency deposits the portion of this payment necessary to cover the entire amount of the sublease by maturity (minus the expected interest to be earned) into low risk investments. The sublease payments are taken from these investments and paid to the lessor. The benefit to the transit agency is the difference in the two lease payments, typically 6-10% of the asset's value.



#### Financial Structure

The following process is implemented for the vehicles delivered that month. These groups are called tranches. During each month of vehicle delivery, King County purchases yen and dollar securities. Ultimately, the entire amount of the lease (minus the expected interest earned over eight years) is deposited into these securities to create a stable revenue stream for the investors. Securities are purchased in two currencies to minimize exchange rate risk to the investors during the lease period. Interest rate risk to the transit agency is

experienced only before the tranche is closed.

The income stream produced by the securities generates fixed payments to the lessors every six months. In addition to these biannual payments, King County pays a final balloon payment of nearly 10% of the equipment cost at the end of the lease term to purchase the vehicles' title.

Vehicle Cost	\$39,480,000
Gross Benefit	\$2,074,300
Estimated Expenses	
King County	\$100,000
Lease Arranger	\$197,400
Total Estimated Expenses	\$297,400
<b>Net Benefit</b>	<b>\$1,776,600</b>

King County did not include four buses in the cross border lease. If any bus included in the transaction is damaged beyond repair (up to four buses), one of the unincluded buses can be substituted. If more than four buses are damaged beyond repair, the lease contract contains a schedule of termination for the entire lease. The payment King County would owe the Japanese investors is prorated by the number of buses destroyed.

### **Transaction Risk**

Once all the securities have been purchased, the transit agency is not exposed to any risk from fluctuations in interest rates. However, interest rate risk was a problem for King County during the first year as tranches were being closed. At the time the lease was arranged, yen CDs earned 3.5% interest. However, during the first year of King County's lease, the Japanese Central Bank lowered Japanese interest rates significantly. In the spring of 1997, yen CDs earned less than 2.5% interest. As a result, for tranches that closed after spring, King County had to deposit more cash than expected in the CDs in order to secure appropriate biannual and final payments. The entire benefit to King county is now expected to total 1.5%. If the slump in Japanese interest rates continues, the benefits to King County may be reduced so much that King County will not close on the remaining tranches. King County estimated that it will incur transaction expenses (for legal council, an appraiser, and a financial advisor) for the project totaling 23% of the gross benefit. The expenses of the lease arranger were to be paid by the Japanese lessor because of the associated tax deduction and passed through to King County in the lease payments.

If the deal fails to close, King County would be liable for payment of these expenses.

### **Lessons Learned**

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The obvious advantage of cross border leasing is monetary: King County expected to realize a 4.5% reduction in the cost of the buses. This \$1.8 million savings allowed King County to preserve the FTA grant and corresponding local match for other projects.

There are some risks which agencies should be aware of which may influence whether the deal closes:

- the benefit to the transit agency is subject to interest rate fluctuations, and
- changes in foreign tax laws can cancel the benefit to the investors.

An example of a risk can be seen with respect to rumors of changes in foreign tax law. In King County's transaction, the first tranche was to close September 3, 1996. The previous weekend, an article was published in Japanese newspapers on potential changes in the tax law. This "scare" delayed the first tranche.

### **Contact Information**

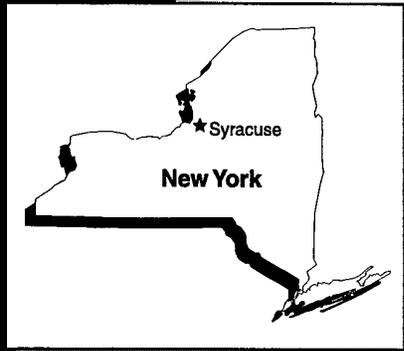
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# **Progress Payments**

**Central New York Regional Transportation Authority  
Syracuse, New York**

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## Central New York Regional Transportation Authority

### Background

With declines in federal capital funding, transit agencies must find new ways to fund bus purchases, whether for fleet expansion or replacement. Traditionally, a transit agency pays for buses in a lump sum upon delivery. This contract structure developed because FTA wanted to ensure that transit systems were purchasing completed products, not financing work in progress.

Because a bus order can take several years to fill, this contract structure generally forces the manufacturer to obtain short-term loans to pay for bus construction. The private sector passes the cost of borrowing money to its customers in the bus purchase price. A transit agency can reduce the manufacturer's cost of borrowing by paying for components as they are completed, and this savings is passed on to the agency by a lower purchase price. The manufacturer may still have to borrow money to pay non-material costs such as labor or administration. Progress payments are often used for rail car purchases because their manufacturing time is even longer than for buses.

### Agency Profile

Service Area	Metropolitan Syracuse, NY (Onondaga, Cayuga, and Oswega Counties)
Modes	Bus
FY96 Operating Budget	\$23.8 million
FY96 Capital Budget	\$4.14 million
Annual Ridership	
Bus	13.3 million
Revenue Vehicle Miles	
Bus	4.63 million
Fares	
Bus	\$1.00

As part of its last two bus procurements, Central New York Regional Transportation Authority (CNYRTA), the transit provider in metropolitan Syracuse, New York, employed a financing technique called progress payments. Instead of the traditional method of payment upon delivery of buses, CNYRTA paid the bus manufacturer for specific bus components as they were purchased or completed. Payments were made to the manufacturing company after CNYRTA saw proof of the purchase of the part.

## Implementation

CNYRTA has purchased buses using progress payments two times, both with Bus Industries of America (BIA) for Orion buses. After contract negotiations began on a request for proposals (RFP) for 28 buses, BIA asked if CNYRTA would make payments as BIA purchased component parts for a savings of \$6,500 or 4% per bus.

CNYRTA followed several steps to implement this financing strategy. First it calculated the net present value of the bus purchase using progress payments versus the traditional payment method. The transit agency found that progress payments would indeed save money. Next CNYRTA asked permission of the regional FTA office to purchase buses using progress payments. FTA said the mechanism could be used for buses as long as CNYRTA documented that the payments corresponded to part purchases and were not advance payments. To this end, FTA suggested that CNYRTA receive proof of each component's completion from the bus manufacturer in the form of supply invoices and purchase orders. CNYRTA also required the manufacturer to purchase performance bonds for 100% of the value of the contract so that if a mistake was made, CNYRTA would receive all its money back.

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**"BIA asked if CNYRTA would make payments as BIA purchased component parts for a savings of \$6,500 or 4% per bus."**

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In addition to the 80% federal payment for the buses, transit systems in New York State receive a 10% state share for capital projects. The New York State DOT agreed that the concept of progress payments was beneficial to transit agencies but refused to participate in the progress payments itself.

## Program Structure

CNYRTA paid invoices as they were received. The agency was then reimbursed by FTA for 80% of the costs. Upon delivery of all the buses, the state paid its 10% share of the total cost of the bus.

## Finances

The first time CNYRTA participated in progress payments, it ordered 28 buses. BIA reduced the bus purchase price by \$6,500 per bus for a total of \$180,773 (4% of the total contract price) as a result. The second time CNYRTA participated in progress payments, the RFP requested eight CNG buses with an option to finance the buses through progress payments if an additional discount was received. The lowest bidders, BIA, offered an \$8,000 discount per bus for progress payments for a total contract savings of \$64,000.

In its most recent bus procurement RFP, CNYRTA has once again asked the bidders to propose an additional discount for progress payment financing. The

low bidders, Nova BUS, declined the progress payments option. In future RFPs, CNYRTA will continue to include the option of progress payments.

**Lessons Learned**

There are three lessons for CNYRTA to share with other agencies interested in progress payments:

- the supplier must document costs before payment is made,
- the purchase price discount preserves the FTA grant and associated local match for other uses, and

- costs for administration and discussions with FTA must be included in net present value calculations.

FTA has been very articulate: grant money can only pay for the costs that the manufacturer has already incurred, not for advances. Transit agencies need to receive adequate documentation from manufacturers in order to prove that all costs paid for have already occurred.

Progress payments decrease the purchase price of buses. Because the bus costs less, the federal, state, and local dollars used to purchase buses can be stretched farther. This method can also be used to purchase rail cars.

**Progress Payment Schedule**

Description	Date	Number of Buses Desivered	Payments
1. Progress payment, 20%*	5/1/91		\$ 1,062,322.00
2. Delivery	5/3/91	1	
3. Release 15% holdback	5/13/91		28,309.35
4. Progress payment, 60%*	6/1/91		3,186,965.00
5. Progress payment, 5%*	9/1/91		265,580.00
6. Delivery	10/4/91	6	
7. Delivery	10/11/91	7	
8. Release 15% holdback	10/14/91		169,856.10
9. Delivery	10/18/91	7	
10. Release 15% holdback	10/21/91		198,165.45
11. Delivery	10/25/91	7 + parts	
12. Final payment	11/4/91		21,471.64
<b>Total</b>		<b>28 + parts</b>	<b>\$ 5,130,834.99</b>

Even though a transit system receives additional savings from progress payments, it must take into account the extra administrative costs associated with progress payments, such as discussions with FTA, administrative oversight of the contract, and draw down of the federal reimbursement after each progress payment.

### Contact Information

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Bus bought using progress payments in 1991.

# **Public Private Partnership For CNG Fueling Facilities and Bus Purchases**

**Metropolitan Atlanta Rapid Transit Authority  
Atlanta, Georgia**

**Central New York Regional Transportation Authority  
Syracuse, New York**

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## Public-Private Partnership for CNG Fueling Facilities and Bus Purchases

As federal mandates for clean air become more stringent, transit vehicles will increasingly need to convert to alternative fuels. Both revenue and non-revenue transit vehicles are being converted to alternative fuels such as methanol, ethanol, natural gas, or propane. The benefits of using alternative-fuel vehicles include cleaner air and less dependence on foreign oil, which leads to more stable fuel prices.

Two pieces of federal legislation are responsible for the alternative fuel push: the Clean Air Act Amendments of 1990 (CAAA) and the Energy Policy Act of 1992 (EP Act). CAAA has had significant impacts on transit funding because it was the impetus for the Congestion Mitigation and Air Quality (CMAQ) Program. CMAQ provides funds for transit under the Intermodal Surface Transportation Efficiency Act of 1991.<sup>1</sup> However, CAAA also set standards for engine emissions which put pressure on transit agencies to convert or purchase alternative-fuel vehicles. In addition, EP Act, which was passed to reduce dependence on foreign fuel, contains a schedule for conversion of bus fleets to alternative-fuel vehicles.

The requirement to convert bus fleets to alternative fuels can be very expensive. Alternative-fuel vehicles are more expensive to purchase than diesel-fuel buses. In addition, transit agencies will have to build new fueling stations for these non-diesel vehicles. While the private sector receives tax deductions to help it fund the conversion, transit agencies do not pay federal income tax and therefore cannot take advantage of the tax benefits, such as the tax credits available under EP Act.

In this case study, we examine the experience of two transit agencies in acquiring compressed natural gas (CNG) bus fleets. Both the fueling stations and the CNG-fueled buses were funded in part by private sector partners. These local natural gas companies provided financial help with construction of the fueling stations and bus purchases and, in return, received tax credits for their investment under EP Act as well as a large new customer for their natural gas.

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## The Experience of the Metropolitan Atlanta Rapid Transit Authority

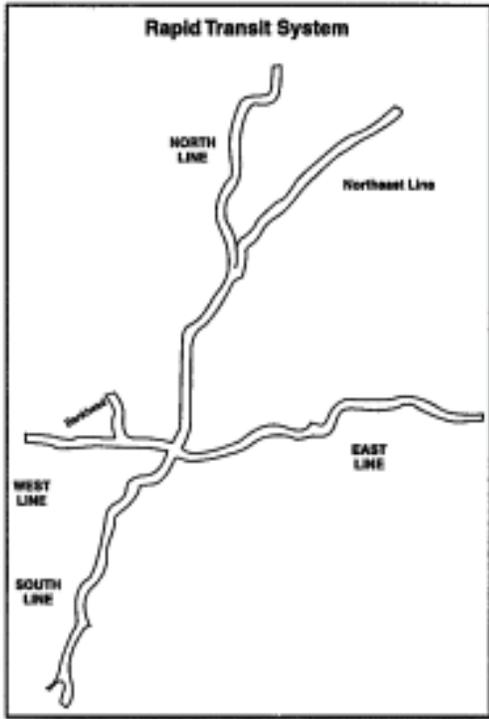
### Background

MARTA operates an extensive bus and rail network with over 29 million annual vehicle miles to provide service to all corners of the City of Atlanta and DeKalb and Fulton Counties, including a 45-mile rapid transit system to connect the major activity centers in the area. The transit system also provides local, express, and rail station feeder bus service. MARTA is especially proud of its service to the spectators of the 1996 Olympic games which allowed it to showcase the system's speed, cleanliness, safety, and customer service to the world.

Highlighted at the Olympics was MARTA's new CNG bus fleet. The fleet was recently purchased by MARTA with financial assistance from the local natural gas utility, the Atlanta Gas Light Company. The fueling facility for these buses was developed through a superturnkey contract by Atlanta Gas Light. Atlanta Gas Light helped pay for the fueling facility, administered the design-build contract, and owns, operates, and maintains the facility.

### Agency Profile

Service Area	Fulton and DeKalb Counties, Atlanta, GA
Modes	Bus, Heavy Rail, Demand Response
FY96 Operating Budget	\$254 million
FY96 Capital Budget	\$441 million
Annual Ridership	
Bus	37 million
Heavy Rail	30.3 million
Demand Response	75,000
Vehicle Revenue Miles	
Bus	31.9 million
Heavy Rail	23 million
Demand Response	1.5 million
Fares (FY97)	
Bus	\$1.50
Heavy Rail	\$1.50
Demand Response	\$3.00



Rail system map

## Implementation

Atlanta Gas Light had been trying to convince MARTA to convert its bus fleet from diesel to natural gas fuel for a decade to showcase CNG technology to businesses in metropolitan Atlanta. The utility chose MARTA because it has a strong community-oriented reputation, a reliable track record, and high visibility vehicles. To convince MARTA that CNG was the right fuel choice, Atlanta Gas Light first built a fueling facility for MARTA's non-revenue vehicles.

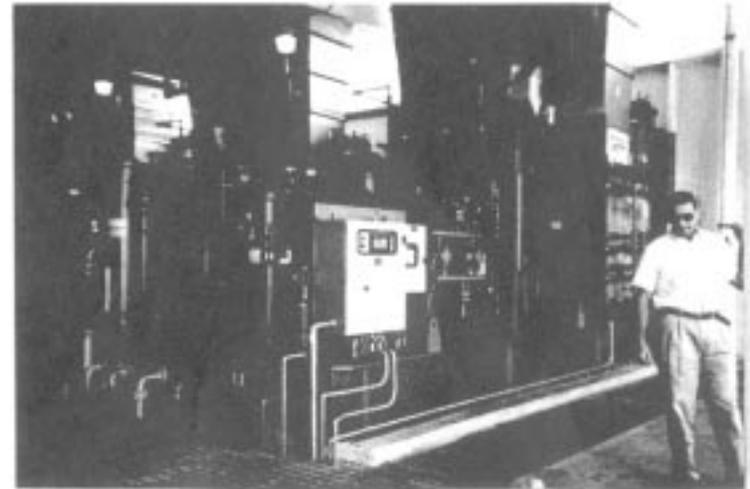
In 1994, MARTA issued an RFP for bus purchases and requested prices for both diesel buses and CNG vehicles. The factors other than purchase price that MARTA considered were

- **Range.** How far would the CNG bus travel between fillings?
- **Fuel pressure.** Because gas pressure builds in the tank faster in the summer heat, the tanks would carry less fuel. How would operations be affected?
- **Bus maintenance costs.** Would the extra weight from 6 CNG fueling cylinders on the bus roof cause extra wear and tear on the brakes and tires?

To encourage MARTA to purchase the CNG vehicles, Atlanta Gas Light offered to cover the entire cost of the fueling facility and provide MARTA with financial assistance to purchase the CNG buses.

## Program Structure

Atlanta Gas Light paid the entire cost to build (\$2.5 million) and maintain the fueling facility. The project was built using a design-build contract with construction oversight by Atlanta Gas Light. Atlanta Gas Light also paid half of the price differential (up to \$25,000) for the first 60 buses and 10% of the price differential for the next 140 buses. In return, MARTA committed to purchasing its natural gas from Atlanta Gas Light.



Natural gas compressor pad

In addition to building the fueling facility, Atlanta Gas Light is also training MARTA's employees. The utility created a series of video tapes which demonstrated the use of the facility and its safety features; designed and teaches a week-long training course for facility employees; and pays for MARTA employees to attend training courses on natural gas compressors.



Fueling facility

### Costs

Because MARTA's CNG buses are less than a year old and still under warranty, MARTA has not yet determined the difference in maintenance costs of CNG buses versus diesel buses. However, according to Pierce Transit in Tacoma, Washington, which has used CNG buses for a number of years, CNG and diesel bus operating costs are equal.

MARTA has compared fuel costs. Natural gas is bought by the therm (1 therm equals 1.4 gallons). Diesel fuel is bought under a contract which sets a fixed price throughout the year, currently 63 cents. MARTA does not have a similar contract for natural gas, so its price varies from month to month. For example, for a gallon of natural gas, MARTA paid 76 cents in February 1997, but only 42 cents in March 1997. If it can negotiate a fixed price for natural gas, MARTA believes that the natural gas fuel will be cheaper than diesel.



MARTA CNG bus

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## The Experience of the Central New York Regional Transportation Authority

### Background

The Central New York Regional Transportation Authority (CNYRTA) provides bus service in and around Syracuse, New York, and to two local universities. Its service area also includes some surrounding counties for a total area of 794 square miles.

CNYRTA wanted to replace its diesel buses with vehicles fueled by natural gas because

- natural gas costs are comparable to diesel,
- alternative-fuel buses are environmentally friendly, and
- natural gas is not imported and thus has a more stable price than diesel.

While CNG fuel is desirable, the bus purchase price and necessary infrastructure for operation are more expensive than for traditional diesel buses.

Building a fueling facility to compress the gas would be particularly expensive. Natural gas is available throughout the State of New York, but at its normal flow rate from a pipeline, buses would take 8 hours to refuel. CNYRTA's diesel buses take 5 minutes to refuel. To refuel

Agency Profile	
Service Area	Metropolitan Syracuse, NY (Onondaga, Cayuga, and Oswego Counties)
Modes	Bus
FY96 Operating Budget	\$23.8 million
FY96 Capital Budget	\$4.14 million
Annual Ridership	
Bus	13.3 million
Revenue Vehicle Miles	
Bus	4.63 million
Fares	
Bus	\$1.00

natural gas buses at a speed comparable to diesel, CNYRTA would need to build a special fueling station, at a cost of over \$4 million. To encourage CNYRTA to purchase the alternative-fuel buses, the local natural gas utility, Niagara Mohawk, offered to let CNYRTA use its existing fueling facility, and the company would provide free fuel for two years.

In 1996, Niagara Mohawk decided to close its refueling station. Consequently, CNYRTA had to build its

own CNG fueling facility. The project will cost over \$4 million: 80% will be paid by the federal government, 10% by the State of New York, and the remaining 10% by CNYRTA.

CNYRTA is experiencing a funding crisis. Over the last few years, federal funding for CNYRTA's capital projects has declined 60%. In the 1990s, receipts from the local mortgage recording tax have declined by nearly 50%, from \$4.5 million to \$2.5 million. With all this lost revenue, CNYRTA did not have the \$400,000 to \$500,000 for its share of the CNG fueling facility construction. In

response to these concerns, the CNYRTA board suggested that management create a public-private partnership to cover the incremental costs of CNG.

## Implementation

CNYRTA issued an RFP to form a public-private partnership to design and build a fueling station and provide natural gas fuel. Proposers were also required to assist CNYRTA in financing its share of the project. The RFP generated three responses. CNYRTA was looking for a partner who was not only interested in the fueling portion or a short-term connection to the project, but a partner with a long-term commitment to making the project work. Thus, the local utility company, Niagara Mohawk, was chosen as the private sector partner.

## Program Structure

Through a turnkey contract, Niagara Mohawk will provide preliminary design, manage the design-build contract, and pay the entire local share (up to \$500,000) of the cost for the new fueling facility. It will also pay the local share of the cost differential between CNG- and diesel-fuel buses for 18 new vehicles. The federal government will pay 80% and the State of New York will pay 10% of the costs. Finally, Niagara



Mohawk will transport natural gas to the new fueling facility to be built at CNYRTA's operations garage.

Niagara Mohawk organized the design-build consortium to include VIP Structures (a Syracuse-based firm with expertise in design-build contracts and their execution) and IMW/Atlas (a Knoxville, Tennessee, firm which will provide the fueling station infrastructure and compressors). Each firm's responsibility is clearly defined in the contract. At each stage in the design process, CNYRTA will approve the work, and the final cost estimate for construction will be adjusted. The facility will be operated and maintained by CNYRTA.

The new fueling facility will also include a fueling site for the public (the second public CNG fueling site in the Syracuse area). The profits from any fuel sold to the public (*e.g.*, taxis, UPS trucks, school bus fleets) will be split 50/50 between the utility company and the transit agency.

The contract originally required the purchase of natural gas from Niagara Mohawk but has since been changed. CNYRTA may purchase natural gas from any provider it wants, but Niagara Mohawk receives fees to transport the gas from the seller to CNYRTA through Niagara Mohawk's pipelines. By allowing the local public utility to profit from the gas transport fees, CNYRTA was able to avoid committing to purchase fuel from a single provider. As a result, the transit agency is able to purchase fuel at more favorable prices.

### **Mobility Emission Credits in New York State**

The State of New York is considering establishing a program for the sale of mobility emission credits. Under this program, transportation providers with emissions less than statutory requirements, can sell these "credits" to providers who cannot meet the emissions requirements. The profits from any emission credit sales from CNYRTA CNG buses would be shared 50/50 between Niagara Mohawk and CNYRTA.

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## Lessons Learned

This case demonstrates that transit agencies need long-term commitments from private sector partners to make projects work. As the project starts, the parties should communicate frequently. These discussions will help the transit agency and the private partner understand the needs of each other's business.

Some private sector partners may require a long-term fuel purchase guarantee. This can result in higher natural gas prices. If possible, CNG should be purchased on the open market to significantly reduce fuel costs.

### Contact Information

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### Turnkey Procurement Benefits

The specialized facility could not be built without design-build because

1. a limited number of people know how to build a CNG fueling facility,
2. design-build is faster than design-bid-build, and
3. participation of the fuel provider in building the facility helps ensure that the provider's needs are included.