Zeitschrift: IABSE congress report = Rapport du congrès AIPC = IVBH Kongressbericht

Band: 14 (1992)

Artikel: Financing methods for large construction projects

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DOI: https://doi.org/10.5169/seals-13803

Financing Methods for Large Construction Projects

Méthodes de financement de grands projets de construction

Die Finanzierung grosser Bauprojekte

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SUMMARY
Several issues must be addressed when private-sector corporations are used to build major infrastructure projects. The profitability of such projects tends to decline in the degree to which they serve the public good. Furthermore, enormous sums of private financing must be found. As a result, efforts are needed to reduce the business risk that arises from changing business conditions and to ensure a fixed level of profitability so that resulting revenues can be used to pay off debt. These requirements have led to a number of governmental measures regarding the construction of the Kansai International Airport and the Trans-Tokyo Bay Highway. Their purpose is to supplement low profit margins and to promote the projects. They include tax breaks, low-interest and no-interest loans, and national and local government investments.

RÉSUMÉ
Au Japon, une nouvelle politique tend à faire construire les grands projets par le secteur privé; il en va ainsi, par exemple, pour l'aéroport de Kansai et l'autoroute de la Trans-Tokyo-Bay. Cependant, la rentabilité de tels projets a tendance à diminuer en fonction de l'utilité publique. Vu les besoins énormes en crédits privés, des mesures gouvernementales s'avèrent indispensables pour réduire les risques commerciaux et garantir un niveau de rentabilité fixé. Pour réaliser les deux grands projets ci-dessus cités, ces mesures impliquent entre autres des avantages fiscaux, des taux d'intérêt préférentiels, des prêts sans intérêt, ainsi que des investissements nationaux et régionaux.

ZUSAMMENFASSUNG
Im Zuge der Finanzknappheit der öffentlichen Hand wurden in den achtziger Jahren viele japanische Staatsbetriebe im Infrastruktursektor privatisiert. Grossprojekte wie der Kansai-Flughafen oder die Trans-Tokyo-Bay-Autobahn wurden privat gebaut. Ihre Profitabilität sinkt jedoch tendenziell mit dem öffentlichen Nutzen. Wegen des riesigen Kreditbedarfs sind Massnahmen zur Senkung des Geschäftsrisikos und Sicherstellung der Rückzahlbarkeit erforderlich. Dazu gehören Steuer- und Zinsvergünstigungen, Anleihen und andere Finanzierungsformen im Rahmen eines umfassenden Entwicklungskonzeptes für Infrastuktur-Grossprojekte.

RESUMÉ:
Comme les finances publiques sont devenues de plus en plus contraignantes dans les années '80, le Gouvernement japonais a cherché à privatiser des entreprises du secteur public - tels que les anciens Chemins de fer nationaux et Nippon Telegraph and Telephone Corp. - de manière à rendre plus efficaces la construction et la gestion des infrastructures publiques. En outre, le Gouvernement a adopté comme politique de faire appel à la vitalité du secteur privé dans des domaines comme le financement et le savoir-faire en management. Cette ligne de conduite est concrétisée dans l'emploi des firmes du secteur privé pour réaliser de grands projets d'infrastructure, notamment l'Aéroport International du Kansai et l'Autoroute Trans-Tokyo Bay.

Plusieurs questions doivent être envisagées quand il s'agit de faire appel à des entreprises du secteur privé pour construire d'importants projets d'infrastructure. La profitabilité de tels projets a tendance à baisser dans la mesure où ils servent le bien public. En outre, d'énormes sommes doivent être prélevées sur le financement privé. En conséquence, des efforts doivent être entrepris afin de réduire les risques qui, pour les entreprises, proviennent du changement des conditions de travail et pour garantir un niveau fixe de profitabilité de manière que les revenus puissent servir à rembourser les dettes encourues.

Ces exigences ont donné lieu à un certain nombre de mesures gouvernementales, relatives à la construction de l'Aeroport International du Kansai et de l'Autoroute Trans-Tokyo-Bay. Leur objectif est de compenser les faibles marges de profit et de promouvoir les projets en question. Parmi ces mesures figurent des réductions d'impôts, des crédits à faible intérêt ou sans intérêt, ainsi que des investissements par les gouvernements à l'échelon national et local.

D'autres mesures doivent être envisagées pour promouvoir des projets d'infrastructure de grande envergure, tout en accordant une attention suffisante à la protection des investisseurs et à la répartition des risques. De telles initiatives doivent combiner des mesures complémentaires de financement, telles que l'emploi de "revenue bonds" et le financement par augmentation des taxes, de manière à obtenir des gains appropriés par une approche intégrée du développement des projets.

ABRISS:
Aufgrund der zunehmenden Anspannung im öffentlichen Finanzwesen der 80er Jahre suchte die japanische Regierung, solche Unternehmen der öffentlichen Hand wie die Japan National Railway und die Nippon Telegraph and Telephone zu privatisieren, um bei der Konstruktion und dem Betrieb von Infrastrukturprojekten eine effiziente Ausführung gewährleisten zu können. Darüber hinaus begann der Staat systematisch, die Vitalität der Privatwirtschaft in Sachen Finanzierung und Führugsinstrumentarium zu nutzen. Diese Verfahrensweise zeigt sich beim Einsatz privatwirtschaftlicher Unternehmen, die solche infrastrukturellen Vorhaben wie den Kansai International Airport und die Trans-Tokyo Bay Highway verwirklichen.

Bei der Inanspruchnahme privatwirtschaftlicher Unternehmen für große Infrastrukturprojekte sind mehrere Fragen zu diskutieren. Die Einträglichkeit solcher Vorhaben tendiert dazu, mit wachsendem Nutzen für das öffentliche Interesse zu sinken. Außerdem müssen bei der privatwirtschaftlichen Finanzierung enorme Gelder aufgetrieben werden. Die Bemühungen konzentrieren sich daher auf eine Verminderung der Geschäftsrisiken, die unter stetig wechselnden Umständen aufkommen, sowie auf ein stetes Rentabilitätsniveau, damit die resultierenden Erträge zur Begleichung der eingegangenen Schulden verwendet werden können.

Diese Anforderungen haben zu einer Reihe staatlicher Maßnahmen zur Konstruktion des Kansai International Airport und der Trans-Tokyo Bay Highway geführt. Ihr Zweck ist es, geringe Gewinnspannen zu vergrößern und die Bauvorhaben verschiedentlich zu fördern. Dazu gehören Steuernachlässe, niedrig verzinste oder zinsfreie Darlehen sowie Investitionen auf nationaler und präfekturaler Ebene.

Bei der Förderung großer Infrastrukturprojekte sind auch andere Maßnahmen in Erwägung zu ziehen, soweit sie dem Schutz der Investoren und der Risikoverteilung dienlich sind. Solche zusätzlichen Finanzierungsmaßnahmen können, gesteuert durch eine integrierte Führung der Projektentwicklung, kurzfristige Schatzanweisungen und Steuerinkrementfinanzierung mit dem Auffangen von nicht vorhergesehenen Entwicklungseinkünften kombinieren.

1. A HISTORY OF PUBLIC INFRASTRUCTURE DEVELOPMENT

As Japan's modernization progressed in the latter half of the nineteenth century, the government was generally responsible for building and operating such major infrastructure projects as highways, major railway lines, telecommunications, and airports. This pattern continued after the conclusion of World War II (1945 to present). Public entities undertook the development of public infrastructure to promote reconstruction and to surmount the bottlenecks that accompanied economic growth. A number of public corporations were established at this time in addition to Japan National Railways, including Japan Highway Public Corporation and Nippon Telegraph and Telephone Public Corporation. These public corporations undertook infrastructure development in their respective areas of operations.

In the years following 1970, Japan's private sector gradually acquired ample capital and human resources. In order to make use of private-sector vitality, a number of public-private companies were established at this time. These firms were largely involved in the development of local public infrastructure projects.

More recently (1983 to present), the growing constraints on public finance has resulted in a number of measures to actively incorporate private-sector initiative in public infrastructure development. First, companies such as Japan National Railways and Nippon Telegraph and Telephone were privatized in order to ensure that the development and operation of public infrastructure takes place more efficiently. Second, private-sector financing and management know-how was put to use more actively in the development of infrastructure serving the public good.

Nevertheless, several issues required addressing before private-sector vitality could be used in the development of public infrastructure projects. They included (1) securing the financing needed for large-scale projects, (2) addressing the decline in profitability that accompanies projects benefiting the public, and (3) reducing increased business risk.

As a result, a number of measures have been implemented. They include such governmental measures as relaxed regulations, tax breaks, low-interest or no-interest loans, interest subsidies, and grants. These measures have been employed in various combinations, taking into account the entities carrying out the projects.

While these supportive measures have seen some success, some of them are not without their problems. The expansion of the nature of aid is also sought for some measures.

Two recent public infrastructure projects will be used to explore the above in greater detail.

2. THE USE OF PRIVATE-SECTOR INITIATIVE IN PUBLIC INFRASTRUCTURE DEVELOPMENT

The Kansai International Airport and the Trans-Tokyo Bay Highway are the two largest public infrastructure projects under way that take advantage of private-sector initiative.

2.1 Kansai International Airport

2.1.1 Project summary

The Kansai International Airport project concerns the creation of a 1,700-ha landfill in the southwest of Osaka Bay and the construction of four runways with lengths between 3,000 and 4,000 m. The first-stage project now in progress concerns the completion of a 511-ha landfill by the summer of 1994.

Plan summary

- Airport
  Location: Southeast area of Osaka Bay, 5 km from shore.
  Size and capacity:

	First stage	Second stage (planned)
Area	511ha	1,200 ha
Runways	3,500 m x 60 m	4,000 m x 60 m 4,000 m x 60 m 3,200 m x 60 m
Landing and takeoff capacity (per year)	160,000	260,000

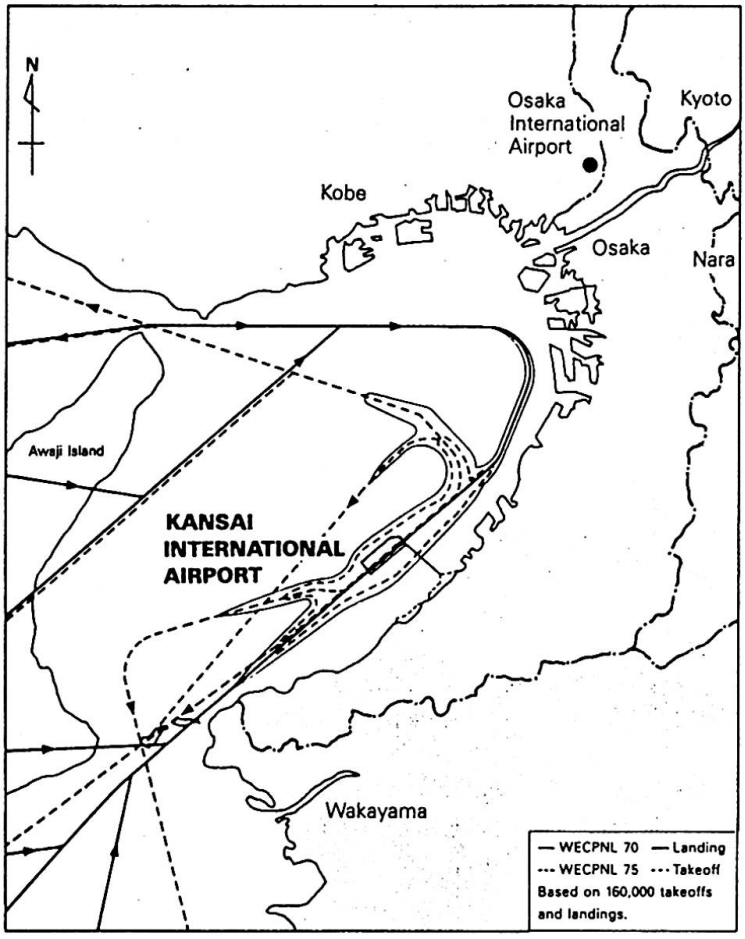
- Connecting bridge
  A 3.75-km bridge supporting both rail and motor vehicle traffic.

- Start of operations
  Summer of 1994, (the second-stage target date has not yet been made specific).

2.1.2 Past airport development

Airport development in the past was carried out by the government in the case of major international airports (Haneda Airport and Osaka Airport) and by a public entity, the New Tokyo International Airport Authority, in the case of Narita Airport. Other airports were generally developed by prefectural and local governments.

Predicted Pattern of Aircraft Noise Distribution



Note: WECPNL (Weighted Equivalent Continuous Perceived Noise Level), the environmental standard index for aircraft noise, is 70 or less for residential areas.

2.1.3 The developer of Kansai International Airport

Because of restrictions on the national budget, the Kansai International Airport is not being developed as a public works project. Rather, a stock company, the Kansai International Airport Company Limited, was established under a special law, and private-sector financing was used in the development of the airport. The role the government took was to supply appropriate levels of public assistance.

Breakdown of Initial Project Costs (FY 1983 prices)

(Billion)

Construction	¥800
Airport island	440
Connecting bridge	120
Runways, terminal building, and other facilities	240
General administrative costs	200
Total	¥1,000 ($7.14)

Notes: 1. Figures above are estimates.
2. The dollar figure assumes U.S. $1 = ¥140.

2.1.4 Project costs

The cost of the first stage of the Kansai International Airport was initially estimated at about ¥1 trillion ($7.14 billion) when using fiscal 1983 construction costs. The current estimate is ¥1.43 trillion ($10.20 billion). (Dollar figures assume U.S. $1 = ¥140.)

2.1.5 Financing and public assistance

The financing and public assistance of the Kansai International Airport consists of (1) national, prefectural, and local government investments, (2) low-interest-rate loans by the Japan Development Bank, (3)

the flotation of government-guaranteed bonds, and (4) the reduction of municipal property taxes.

In order to supplement the low profitability of the project, capital investment of ¥300 billion, or 30 percent of the initial cost of ¥1 trillion, was planned (¥200 billion from the national government, ¥50 billion from prefectural and local governments, and ¥50 billion from the private sector). The remaining ¥700 billion was to be procured through the flotation of government-guaranteed bonds, as low-interest-rate loans from the Japan Development Bank, and as private-sector bank loans.

However, the estimate of the first-stage project climbing to ¥1.4 trillion has meant a financing shortfall and reduced profitability. Financing plans are therefore being reviewed.

Initial Financing Plans

(Billion)

Investments	¥300	(30%)	$2.14
National govenment	200		
Prefectural and local governments	50		
Private sector	50		
Borrowings, other	700	(70%)	5.00
Total	¥1,000	(100%)	$7.14

Note: The dollar figures assume U.S. $1 = ¥140.

2.2 Trans-Tokyo Bay Highway

2.2.1 Project summary

The Trans-Tokyo Bay Highway will traverse a 15-km stretch across central Tokyo Bay; the project is scheduled for completion in March 1996. An underwater motor-vehicle tunnel of 10 km, the longest in the world when completed, will cross the west side of the bay, which is heavily traveled by ships. The remaining 5 km will be a bridge.

2.2.2 Past highway development

Highway development in the past has been carried out by the national government in the case of national highways and the Japan Highway Public Corporation (JHPC), a government entity, in the case of major toll roads. Highway construction has therefore been considered public-sector projects in the past. Nevertheless, the application of private-sector initiative is beginning to take place. In the construction of the Honshu-Shikoku Bridge, which connects the major islands of Honshu and Shikoku, a Honshu-Shikoku Bridge Authority was established, and a substantial amount of the financing came from the private sector.

2.2.3 The developer of the Trans-Tokyo Bay Highway

A public corporation was not chosen as the developer of the Trans-Tokyo Bay Highway. Rather, a stock company, the Trans-Tokyo Bay Highway Corporation, was set up under a special law (as was in the case of the Kansai International Airport) to carry out the project. However, although the Kansai International Airport Authority will continue to manage and operate the completed airport, the Trans-Tokyo Bay Highway Corporation will turn over all facilities on completion to the JHPC since the transbay highway will become a part of Japan's national highway network. Centralized JHPC administration of the new highway was considered most appropriate to secure the public good and to uphold the efficiency of the national highway network.

2.2.4 Project risk

Any risk regarding the profitability of the project will be borne by the JHPC since the completed facilities will be turned over to the JHPC and since construction costs will be paid for by the JHPC in installments over a thirty-year period.

2.2.5 Project costs

The total cost of the Trans-Tokyo Bay Highway is estimated at ¥11.51 trillion (U.S. $8.20 billion). Project costs for the Trans-Tokyo Bay Highway Corporation is estimated at ¥9.40 trillion ($6.70 billion). The remaining ¥2.12 trillion ($1.50 billion) will come from the JHPC and will go for such expenses as fishing industry compensation.

Project Costs

(Billion)

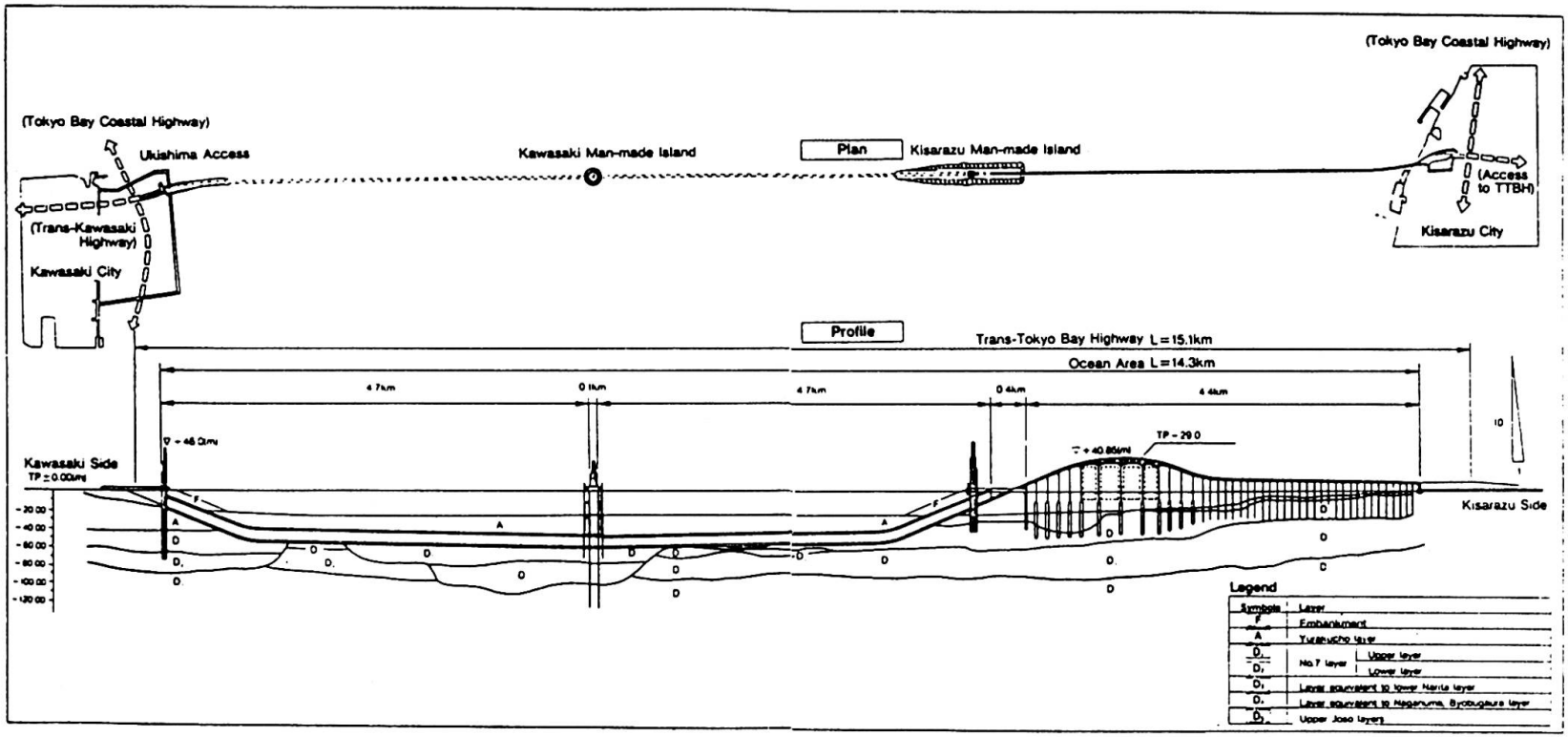
	Trans-Tokyo Bay Highway Corporation	Japan Highway Public Corporation	Total
Project costs	¥789.1	¥140.9	¥933.0
Interest and other expenses during construction	150.4	70.7	221.3
Total	¥939.7 ($6.7)	¥211.6 ($1.5)	¥1,151.3 ($8.2)

Note: Dollar figures assume U.S. $1 = ¥1.40

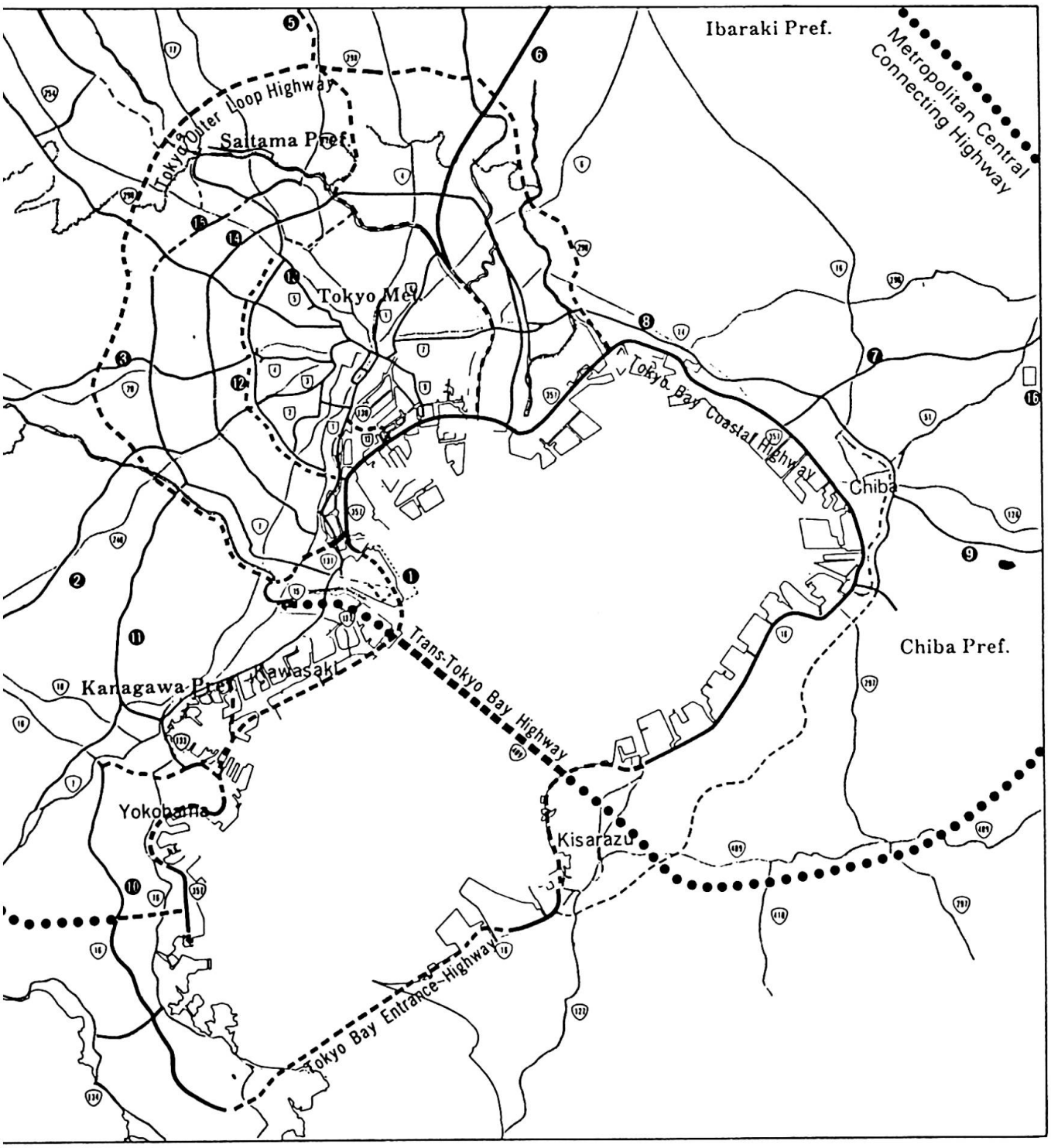
2.2.6 Financing and public assistance

The financing and public assistance of the Trans-Tokyo Bay Highway consists of (1) national (JHPC), prefectural, and local government investments, (2) low-interest-rate loans from the national government (from the Highway Development Fund) and the Japan Development Bank, and (3) the flotation of government-guaranteed bonds.

Trans-Tokyo Bay Highway (15.1 km)



Metropolitan Highway Network



end:

- Tokyo Bay Coastal Highway
- Tokyo Outer Loop Highway
- Metropolitan Central Connecting Highway
- Metropolitan Expressway
- Expressway & Toll Roads
- National Highways
- Principal Local Roads

❶ Tokyo International Airport (Haneda)
❷ Tomei Expressway
❸ Chuo Expressway
❹ Kan-etsu Expressway
❺ Tohoku Expressway
❻ Joban Expressway
❼ Higashi Kanto Expressway
❽ Keiyo Highway
❾ Chiba-Togane Highway
❿ Yokohama-Yokosuka Highway
⓫ Third-Keihin Highway
⓬ Central Loop Route
⓭ Loop No. 6
⓮ Loop No. 7
⓯ Loop No. 8
⓰ New Tokyo International Airport (Narita)

The capital of the Trans-Tokyo Bay Highway Corporation is somewhat modest at ¥60.0 billion. The interest paid for overall financing has been lowered to about 6 percent through such assistance measures as low-interest government loans (at one-half the interest of market rates). This assistance combines a no-interest government loan of ¥125.0 billion and a private-sector loan of ¥125.0 billion.

Beakdown of Financing

(Billion)

Investments	¥60.0	No interest
Government(JHPC)	20.0	
Prefectural and local government	20.0	
Private sector	20.0	
Low-interest government loans	250.0	1/2 of market rates
Loans from government lending institutions	20.0	About 1% below Market rates
Government-guaranteed bonds	389.1	Market rates
Private-sector loans	220.6	Market rates
Total	¥939.7 ($6.71)	

Note: The dollar figure assumes U.S. $1 = ¥140.

3. CHARACTERISTICS AND ISSUES ASSOCIATED WITH INFRASTRUCTURE DEVELOPMENT USING PRIVATE-SECTOR INITIATIVE

A number of benefits can be noted regarding the use of private-sector initiative in public infrastructure development.

1. Development can proceed independently of the financial circumstances of the national government. Furthermore, the government's single-year accounting system ties public-works projects to an annual budgetary process. More flexibility is introduced when a private company carries out development projects.

2. A private company can solicit the cooperation of private-sector human resources and take advantage of private-sector technological and management know-how.

3. The use of private-sector funds becomes easier.

Nevertheless, a number of issues still remain.

1. The higher a given project serves the public good, the lower its profitability. This makes public assistance indispensable.

2. Since the financial environment can be volatile, uncertainty accompanies large private-sector financings.

3. Measures are needed to address business risks associated with changes in business conditions.

In particular, feasibility studies should be carried out beforehand by both the public and private entities involved to develop contingency measures for instances when cost overruns trim profitability.

4. FUTURE DIRECTIONS

As can be seen from the above, Japan has developed various measures to make use of private-sector vitality in public infrastructure development. Other financing measures, such as community bonds, have either been tried or are under consideration.

Other nations are also exploring diverse financing mechanisms, including the issue of such debt instruments as revenue bonds (where future profits are used as security), tax increment financing (where future tax increases are used as security), and floating-rate bonds.

The build, operate, and transfer method, which takes advantage of the superior business know-how of private corporations, is also being increasingly tried for public infrastructure development.

In order to use private-sector financing in large public-works projects, a certain level of profitability must be guaranteed to make it possible to pay off accumulated debt. This requires the careful consideration of the characteristics and categories of projects for which private-sector financing can be employed. In addition, these projects should be promoted by effectively combining assistance measures. This could be done by pairing financing methods with the capture of windfall development gains through an integrated approach to project development. Furthermore, the perspectives of investor protection and risk dispersal must not be overlooked.

As development needs become more diverse and sophisticated, the continued use of private-sector initiative in the development of public infrastructure will be vital, based on the examination of the issues just mentioned. For that reason, the Trans-Tokyo Bay Highway Corporation will work to ensure that the Trans-Tokyo Bay Highway project will become an appropriate precedent for the use of private-sector vitality in the development of public infrastructure.

New Financing Methods

	Mountain, river, and seacoast improvements	Public highways, urban parks, natural parks	Cultural, social, educational and sports facilities; public rental housing	Health care facilities, water supply and sewage systems, waste disposal	Toll roads, airports, seaports	Electricity, gas, railroads, telecommunications	Remarks
Profitability	<——None——>		Little<——			——>Large	
Build, operate, and transfer			<– – – – – – – – – – ————>	Large electric power plant (Turkey) Undersea tunnel (U.K., France), expressway (Thailand) Undersea tunnel (Hong Kong)			Private firms undertake the planning, fund procurement, management, and operations of the project. The profits during the period of private management go for investment recovery. The project is then turned over to the project initiator after a specified period. The method is appropriate for large projects likely to be profitable.
Revenue bonds			<———— – – – – – – – – –> Water supply systems (U.S.), toll roads (U.S) Port authorities (U.S.), electricity and gas supply (U.S.)				The revenues generated by the project are used for debt service. The method is widely applicable when debt service (the repayment of principal and the payment of interest) is tailored to the earnings prospects of the project.
Community bonds		<– – – – – – – – ————>	Gymnasiums (Japan), citizen centers (Japan) Swimming pools (Japan)				A kind of privately placed bond issued by local government entities and purchased by local citizens and businesses. Since the development area is limited, the method is appropriate for community-based projects.
Special assessment district		<– – – – – – – – ————>	Highway development (U.S.), urban rapid transit (U.S.) Shopping malls (U.S.)				The project is financed by placing a surcharge on the property taxes or other taxes paid by the citizens of a particular district. The prior approval of district property owners is required.
Tax increment financing	<– – – – – – – – ———— – – – – – – – – –>	Roads (U.S.), water supply and sewage systems (U.S.) Housing and parking lots (U.S.)					A district that will benefit from the project is defined, and bonds are issued that are secured by an incremental tax on local property taxes or other taxes. Although relatively widespread application is possible, it is difficult to accurately anticipate the revenues generated by the incremental tax increase.
Convertable mortgages	<– –>						Bonds in which a debt interest can be converted into an equity interest in land or buildings. The method is difficult to use alone for public infrastructure development. However, it can sometimes be combined with other financing methods.

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