

# The Airport Access Problem in Tokyo

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•AN EXTENSIVE NETWORK throughout Japan has been developed by the Japanese National Railways (JNR) during their 80 years of operation. Domestic air routes overlap this network, connecting the main urban centers. Therefore, the two systems are highly competitive. The Japanese domestic air industry has developed remarkably thanks to recent innovations in air technology, and in 1967 it became the world's second largest in the number of passengers carried, despite its comparatively late start and limited geographic area.

## AIR VERSUS RAILROAD SERVICE

The merits and demerits of the two transportation systems are evaluated by the public. Safety, comfort, fares, and time are the chief factors of comparison. At one time it was believed that air travel was inferior with respect to safety. With the recent good performance record, however, safety has become a less important question in air travel. Comfort in the air itself is far better since the advent of jet aircraft. Fare and time considerations are the keenest points now in contention. In Japan air fares are fixed with careful consideration of the railroad fares. The growth of air traffic and the progress in aircraft technology tend to lessen the operational cost. On the other hand, the railroads face serious cost-inflationary trends. In the future, fares between the two modes may become even more competitive.

But what about the time comparisons? Air travel is believed to be much faster than rail as far as the trip time between air terminals is concerned. But the user's concern is the time it will take him from the point of origin to the point of destination of his particular trip. The railroad usually has its terminals in the centers of cities because of its linear nature. On the other hand, the air carrier has its terminals in the suburbs or at a distance from the center of a city because of its operational requirements. Access to the airport and terminal transfer have not been serious problems until recent years. They pose one of the most serious problems of the air industry now, however, because of the rapid growth of air traffic volume and the increase in the number of automobiles, which are causing congestion on existing highway facilities. The advantages to be brought to the air industry by an increase of aircraft size (e.g., jumbo jets and air buses) and the increase of speed (e.g., the SST's) are being offset by the discomfort and delays resulting from problems of getting to and from the airport.

Is a conventional railroad transit system an answer? The railroad has been in service more than 100 years. It was indeed a revolutionary innovation when introduced, and it has established its own mode of services and flourished. The automobile was invented and brought into practical use much later than railroads and has advantages over some railroad services. Some people say that "riding on the air" is preferred to the "friction between steel". This is not the only reason for people's preference for automobiles. The door-to-door convenience and the instantaneous availability of the automobile are insurmountable advantages of an automobile over the scheduled, point-to-point nature of rail service. It is going to be very difficult to get people to abandon their cars as a way of getting to and from airports. If we are going to depend on some railroad type of service to the airport, we have to work out special devices

to satisfy the needs of airport passengers and to make this service more attractive to them than that of existing railroads; otherwise, it will be a business failure due to "rejection reaction" by the public.

The airport access problem is both a domestic and an international air service problem. After the advent of SST's, it is predicted that air travel time on major segments of the world air routes will be drastically cut. It seems ridiculous to think that, after flying from Hong Kong to Tokyo in 1 hour and 35 minutes, the same passenger will spend 2 hours getting from the airport to downtown.

#### HISTORICAL DEVELOPMENT OF THE TOKYO INTERNATIONAL AIRPORT ACCESS PROBLEM

Tokyo International Airport is located some 18 km from downtown Tokyo and half-way between Tokyo and Yokohama. The greater Tokyo metropolitan area (including Kawasaki and Yokohama) spreads like a big fan, with Tokyo International Airport acting as the rivet.

In Tokyo, public transportation systems are well developed. There are the Japanese National Railways electric train network, subways, street cars, private railroads, and bus lines. The Japanese National Railways network is the main artery of passenger flow in this area (Fig. 1), but the network is mainly directed to the downtown area. There were only three routes to Tokyo Airport before the Olympics in 1964, as shown in Figure 2. The three routes were (a) by the local primary highway routes; (b) by the Japanese National Railways to Kamata Station, then by bus or taxi to the airport; and (c) by the Keihin Express Railroad (KER), which is a private railroad, and then by bus to the airport. The route using the Japanese National Railways, then transferring to the Keihin Express Railroad, again changing cars to the airport spur station (which is 2 km from the airport terminal building), and then by bus to the terminal is so cumbersome that the general public has never patronized it. Only employees working at the

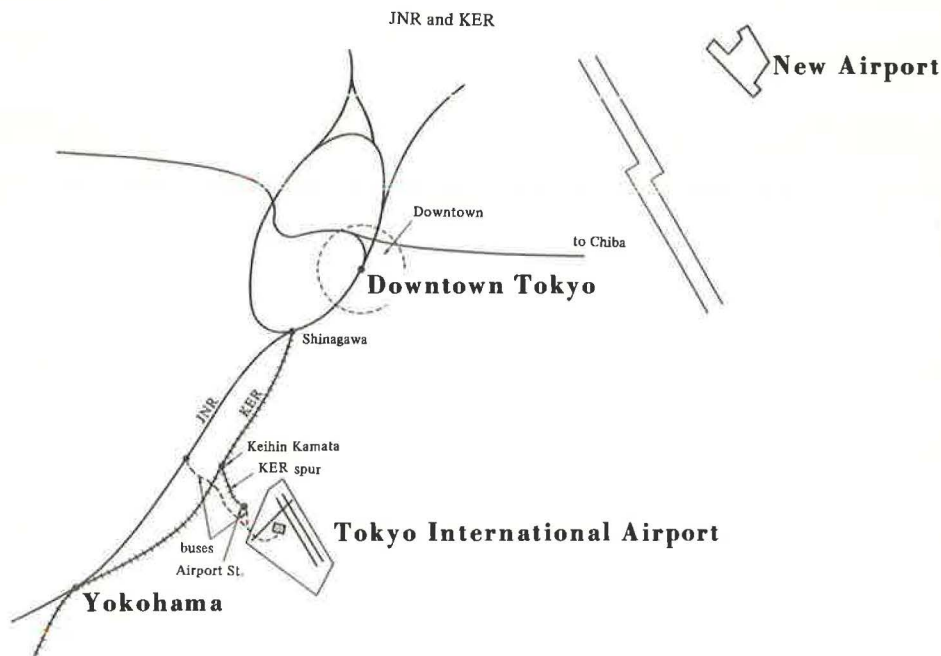


Figure 1. Relationship of Japanese National Railways and Tokyo International Airport.

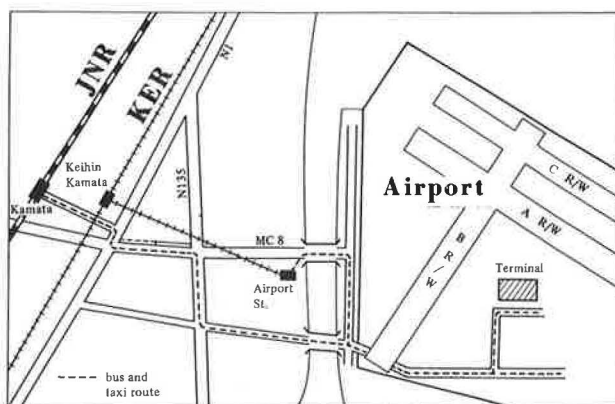
airport who lived alongside the railroad used it. Thus, there were really only two main access routes: Japanese National Railways and the public road.

Using the Japanese National Railways network to go to the airport required a change in transportation at the Kamata station from the railroad to a bus or a taxi. This route was not favored by the public but was patronized by airport employees for commuting and by a small number of people who came to the airport from the south. Most traffic to the airport depended on the public roads. With the development of the Japanese economy, these routes began to become very congested because they were the most important highways connecting Tokyo and Osaka and Tokyo and Yokohama. Just before the Olympics, it took 1 to 1½ hours from downtown to the airport, and the time became utterly unpredictable because of the congestion.

In 1964, immediately prior to the Olympics, the Tokyo Monorail and the Metropolitan Expressway were opened (Fig. 3). After the completion of the expressway system, the travel time between the downtown area and the airport was cut from 1½ hours to 30 minutes. The Tokyo Monorail achieved an impressive showing during the initial months, but, with the general recognition of the convenience of the expressway, the monorail lost a crippling share of passengers to the expressway. The resulting loss of business was such that the monorail had to undergo a financial reorganization.

In November 1969, the Metropolitan Expressway System was extended to Yokohama, the extension starting just outside Tokyo International Airport. With the opening of the extended expressway between Tokyo and Yokohama, traffic poured onto that part of the system linking the downtown area and the airport, swelling the number of vehicles using that segment to 90,000 compared to the designed daily load of 60,000 vehicles. There has developed a chronic slowdown of traffic, and, once an accident occurs, queues of cars extend as long as 2 to 3 km. Not infrequently, it takes more than an hour to reach the airport. In the meantime, the reorganized monorail has built a bridge linking its terminal with the adjacent Japanese National Railways Hamatsucho station, and a new station at the separate maintenance area at the airport. To facilitate its utilization, fares have been reduced. Thanks to such renovations, the patronage of the monorail improved by 18 percent over the preceding year. Because of the lack of facilities for handling baggage, however, passengers carrying baggage—especially international passengers—still could not use the monorail with ease.

The congestion on the expressway is increasing daily and slowdowns caused by traffic accidents or other reasons not only delay passengers beyond the scheduled departure times but also thwart the efforts of the airlines to maintain punctuality of their services. Recently the airlines abolished their check-in service at downtown offices and their own bus services on the expressway. The punctuality of the monorail is highly appreciated by the airlines, and they have started a campaign to recommend that their passengers use the monorail as often as possible. For whatever the reasons, the number of passengers using the monorail is steadily increasing, although it will not become profitable probably until there is a doubling of air traffic. To improve the access further, studies for another highway link to Tokyo International Airport are being conducted.



**JNR - Japan National Railway**  
**KER - Keihin Express Railroad**  
 ---- bus and taxi routes

Figure 2. Three access routes to Tokyo International Airport prior to the 1964 Olympics.

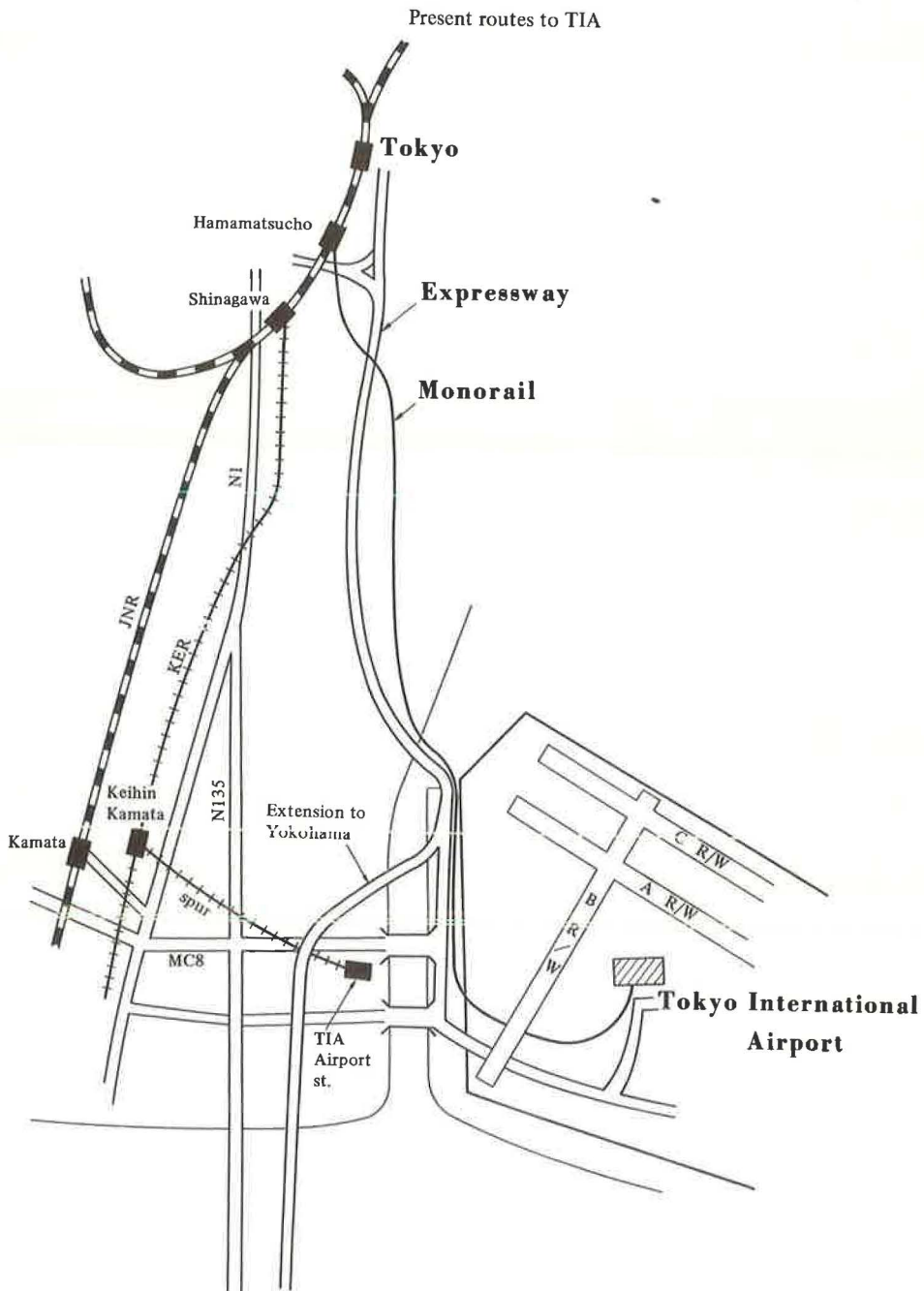


Figure 3. Metropolitan Expressway and Tokyo Monorail routes to Tokyo International Airport.

TABLE 1  
GROUND TRAVEL TIMES AND COST BY MODE  
FROM DOWNTOWN TOKYO TO TOKYO  
INTERNATIONAL AIRPORT

Mode	Time (min)	Cost (yen)
JNR and bus	60	90
JNR and taxi	50	300 <sup>a</sup>
JNR and KER and bus	60	120
JNR and monorail	35	180
Bus via expressway	30-60	120
Taxi via expressway	30-60	1,000
Taxi via local roads	50-60	850

<sup>a</sup>Five may ride for same price.

TABLE 2  
TRAFFIC BY MODE TO AND FROM  
TOKYO INTERNATIONAL AIRPORT

Mode	Total	Percent
JNR and bus or taxi	3,698	9.1
JNR and monorail	5,834	14.4
KER	1,210	3.0
Bus	1,726	4.3
Company bus	49	0.1
Automobile	22,407	55.2
Charter bus	2,800	6.9
Other	2,872	7.0
Total	40,596	100

## STATISTICAL ANALYSIS OF THE TRAFFIC TO TOKYO INTERNATIONAL AIRPORT

The comparison of time and cost of the various modes from Tokyo to the airport are not necessarily limited to the downtown area. Therefore the data given in Table 1 do not mean too much because the traffic to and from Tokyo airport does not come only from the central business area.

The main traffic to the airport, namely air passengers and their related well-wishers, uses automobiles nearly 70 percent of the time. More than 55 percent of the total traffic depends on highways and automobiles (Table 2). We can easily conclude how important the road connection is in the airport access problem and how difficult it is to divert the main traffic from automobiles to some railroad type of facility.

## ACCESS PROBLEM TO THE NEW TOKYO AIRPORT

The new Tokyo airport will be constructed at Narita, 66 km northeast of Tokyo, in Chiba Prefecture. Using the existing roads that link downtown Tokyo with Narita takes easily  $2\frac{1}{2}$  to 3 hours by car. In an effort to alleviate this problem the East Kanto toll road that links downtown Tokyo with Chiba City is being constructed. This expressway is the only egress to the east from Tokyo. The traffic condition is already so bad that, even though two lanes will be added, the driving time between Narita and Tokyo will still be totally unpredictable. There is a lot of talk about future improvements, but we are afraid that it may take quite some time before the situation is substantially improved. We felt the necessity of a city check-in facility to ease the irritation and anxiety of international passengers due to the road congestion.

With a view to drawing some lessons from the experiences of other major airports and cities around the world, our company sent a survey team to several cities in 1968 to investigate their situations. Our findings included the following:

1. Most of the cities maintain a city terminal in one form or other, from which point the passengers are transported by buses or limousine service to the airport.
2. Only one city, namely Brussels, Belgium, has a railroad link between the city airport terminal and the airport.
3. There were nine city terminals that had passenger check-in facilities, three had no such facility, and one handled check-in service for only a special category of passengers.
4. With regard to the method of shuttle bus operation, there were four cities that scheduled service for each incoming and outgoing flight, while others operated the bus at regular intervals.

With regard to bus fares, the ratio between the bus fare and the taxi fare is noteworthy. The lowest taxi fare was 2.4 times the bus fare and the highest was 10.2 times. At airports where the taxi fare was high, the number of passengers utilizing the city terminal was also greater. The highest percentage of passengers using the city terminal was 43 percent, and the second highest was 35 percent. Both were in London,



The lowest percentage was 5 percent in Frankfurt. In spite of the high ratio of the taxi fare to the bus fare (8.3) in Frankfurt, the number of passengers utilizing the city terminal was low. Perhaps this was due to the fact that the city terminal lacked the function of checking in passengers.

To run a bus for each flight undoubtedly suits the convenience of the passenger but the operator may run the risk of low seat occupancy rate and delayed flight schedules. The organizations that operated the city terminals were classified as follows:

Those run by the airlines themselves	7
Those run by independent companies	5
Those run by the municipality	1

What about the city terminal served by a railroad instead of buses? Much is expected in the future for the city-airport connection using a railroad type of service. It was disappointing, however, to learn that the rate of utilization of the airport-railroad link in Brussels was so low that the check-in service at the city terminal might be discontinued.

In the case of the Brussels airport, there existed a railroad right-of-way running to the planned site of the airport. Therefore, it was decided to utilize this for the city-airport connection. The cost for the construction of the underground station was to be borne by the national railroad and the ground and the second floors of the terminal building by Sabena Airlines. The operation of the railroad was to be the responsibility of the national railroad, and the operating expenses and the revenues were the responsibility of Sabena. The arrangement seemed ideal. The passengers may check in their baggage at the city terminal and then take the train to the airport. At the airport they can proceed to the gate lounge entirely carefree (Fig. 4). Disembarking from the aircraft, the passenger also has merely to tell a baggage agent "the city terminal" following the custom clearance, and the baggage is transported to the city terminal by train, ready to be delivered to the passenger upon claim at the claim counter. No other arrangement can be more ideal for air passengers. The railroad coach is also specially

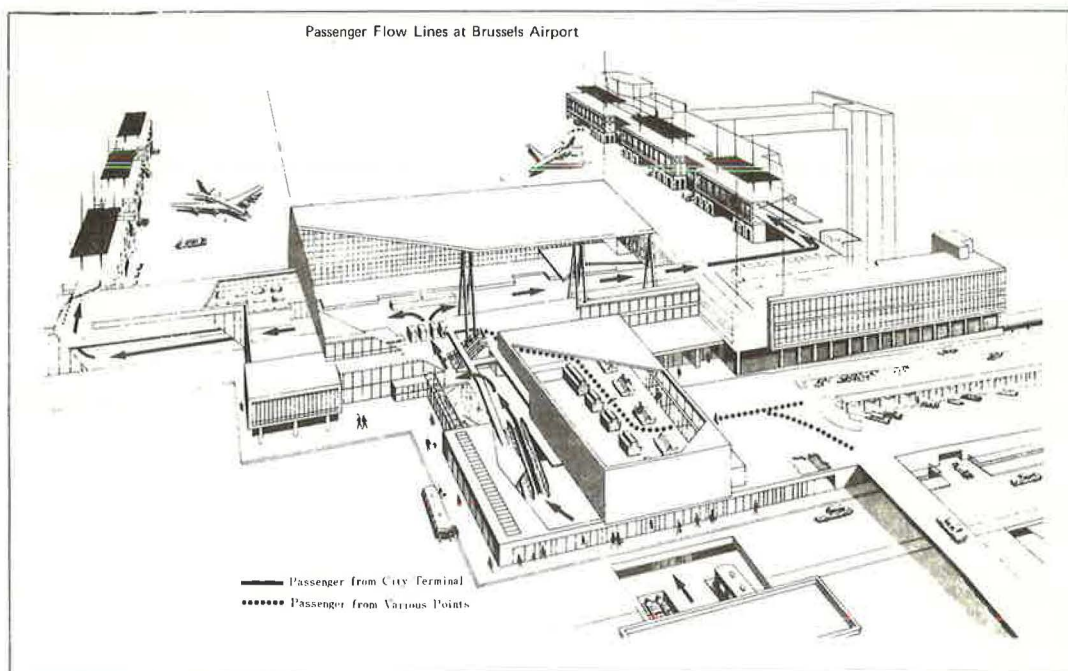


Figure 4. Passenger flow lines at Brussels Airport.

designed and looks luxurious. However, that it might be discontinued for lack of demand leaves much to be pondered.

The main reason for the lack of interest in such an ideal system on the part of passengers may be general preference for automobiles to a railroad, a kind of "rejection reaction" against the railroad service. This reaction seems to be especially strong, inasmuch as the distance to the airport is short (16.5 km) and the surface traffic condition is not too congested.

We must therefore be very careful about the optimistic argument that a railroad type of facility is the only solution to the city-airport connection problem.

### OUR INTERIM MEASURE TO SERVE THE NEW TOKYO INTERNATIONAL AIRPORT

From this survey, we drew the following conclusions:

1. A city terminal that has a passenger check-in facility is desirable because (a) such a facility can ease irritation and anxiety of passengers to travel for such a long distance to the new airport over congested highway routes; (b) if such a facility has enough space for people to perform the customary courtesy and formalities of well-wishing to incoming and outgoing passengers, it will enable them to eliminate traveling the long distance to the new airport; (c) through such a facility passengers are transported en block by limousine or buses, which will help ease the road congestion; and (d) if the new airport terminal is designed like No. 1 terminal of Heathrow, London, to accommodate separate flow lines for passengers to and from the city terminal, it can ease the curbside congestion, save the counter length, ensure a smooth flow of passengers inside the terminal, and eliminate wasteful double investment and double handling.

2. City terminals should be located at a strategic point with easy access to downtown and to the new airport.

3. At the city terminal passenger check-in, service must be of high quality and without delay.

4. The limousine/bus service should be established in which the vehicle to be employed should be specially designed, large-sized, and high-speed and have fewer seats than an ordinary commercial bus to meet air-passengers' taste, with a special baggage compartment to meet the requirement of by-flight operation; the operation of buses should be by flight as much as possible; the fare should be less than one-third of the taxi fare on the same route; and there should be a city terminal-hotel connection service as is now being done in Tokyo.

Based on these conclusions and with the close cooperation of all parties concerned, a new city terminal site was selected (Fig. 5) and a new company was established that will construct and operate the facility.

The site is underneath an expressway interchange that connects the expressway downtown network with three feeder highways. It is located northeast of the center of Tokyo.

The city terminal will be directly connected with the city-bound expressways as well as to the expressway leading to the new airport. The ground floor will have passenger check-in counters; the second floor, a concourse will have gift shops and a spacious waiting lounge; the third floor will house the departure and arrival platforms of limousine buses; and the basement will be used for short-term parking. Another feature of this project is that there will be terminal facilities for city buses and long- and medium-distance buses to outlying areas. Baggage will be checked-in at the ground floor counters, moved down to the basement sorting area by belt conveyors, and after being sorted into separate lots by flights, lifted up to the bus platform by means of bucket type of conveyors. This system is still under study.

Another project to meet the traffic demand to the new airport is an extension of the existing Keisei Line, a private railroad. This will take 1 hour from its Tokyo terminal, located about 20 minutes' distance from the center of Tokyo. The line is also connected with one of the subway lines, passing near a Tokyo monorail terminal. It will take about 70 minutes from there and is expected to be patronized by commuters.

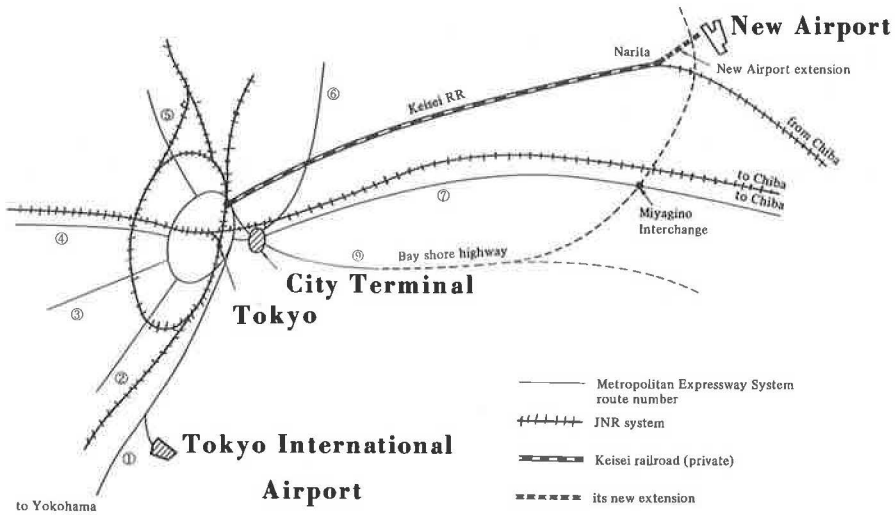


Figure 5. Proposed terminal site of new Tokyo airport and access routes.

### THE FUTURE PROJECT

There are many projects being discussed now. One is the improvement of the expressway system. As previously stated, the bottleneck is the highway system to the new airport. Therefore, to ease congestion at the connecting parts of the expressway to Tokyo, multiple approaches and a direct route are being studied.

Also, a new railroad with Tokaido Line standards for the Japanese National Railways is being considered between Tokyo and the new airport, which will, when completed, cut down the traveling time to 30 minutes. For this plan the necessary investment is tremendous, and there is a serious problem as to who should bear the costs and deficit. However, in considering such an investment, we have to be very watchful about the precedent of the Brussels case.