
TRANSPORT, ROADS AND TRAFFIC

1 Introduction

In April 2016, new toll rates for expressways came into effect in the Tokyo metropolitan areas. For historical and other reasons involving infrastructure, expressway tolls had been route-based and burdened with issues such as toll rates that differed between routes. The new toll system unifies the toll rates for the Tokyo metropolitan area expressway network as a whole (inward of the Ken-O Expressway), and has been made easier for users to understand and utilize. If the previous toll system was suited to the era infrastructure expansion, the new system emphasizes usage to efficiently capitalize on today's well-developed expressway networks such as the Ken-O Expressway.

Based on the Interim Report (July 2015) of the National Arterial Road Sub-committee of the Road Committee of the Panel on Infrastructure Development, which spurred the changes to the toll system, this article not only provides a synopsis of the issues faced by the previous system and of best practices for the toll structure, but also discusses the characteristics of the new expressway tolls.

2 Issue faced by the previous system

Since around 1960, several expressway operators have built expressways exhibiting the different attributes listed below in the Tokyo metropolitan area.

- The Shuto Expressway, built to alleviate congestion in the city center.
- National road networks built for national land development purposes such as linking metropolitan areas (e.g., the Tomei Expressway).
- General toll roads built to alleviate congestion and reduce accidents on national roads (e.g., the Keiyo Road).

The toll system for individual expressways was determined according to the particularities of the various operators (reflecting construction, management and other

costs). The subsequent development of the infrastructure into a network of interconnected expressways, resulted in a Tokyo metropolitan area toll system pieced together from systems determined individually for each route.

The issues involving the various expressway tolls were as follows.

2.1. Shuto Expressway

The toll for the Shuto Expressway used to be a fixed fee collected at the entrance ramp, but with the spread of ETC making it possible to identify which exit was used, distance-based tolls had been applied to ETC-equipped vehicles since 2012 in the interest of fairness in terms of use and burden. However, the toll was not fully distance based (it consisted of a five-step scale with a maximum toll of 930 yen), and the low cost of driving long distances through the city center led to the issue of drivers choosing an inefficient route (because going through the city center was less expensive than avoiding it). In addition, the Shuto Expressway only distinguished between standard size vehicle and large size vehicle rather than between the five vehicle categories applied on most expressways.

2.2. National road network

Expressway tolls on the national road network were based on distance from the start, but there were some fixed fee sections on some expressways, such as the Tokyo Gaikan Expressway, and the Chuo Expressway.

2.3. General toll roads

Toll rates varied between routes, as exemplified by the 15.7 yen/km rate on the Daisan Keihin Road compared to the 44.0 yen/km on the Yokohama Yokosuka Road. Moreover, some routes, such as the Keiyo Road, only distinguished between the three categories of standard size vehicle, large size vehicle, and extra-large vehicle.

All of this created issues such as the toll rate and vehicle category differences between Tokyo metropolitan area routes and sections making the system difficult for

users to understand or utilized, and perception that was expensive due, for example, to the fixed fee imposed when travelling through roads run by different operators. Furthermore, the establishment of ring roads such as the Ken-O Expressway made it possible to use different routes on trips with the same start and end points, presenting the issue of tolls varying by route due to the toll rate differences between the various routes.

3 Best practices for the toll structure —

The Interim Report defines a vision of a rational toll structure for the smart use of the overall Tokyo metropolitan area expressway network in terms of the following three smart principles for Tokyo metropolitan area tolls:

(a) Fair toll structure based on actual use

A fair toll structure based on the mindset of the burden on the beneficiary and designed on the basis of distance.

(b) Simple and seamless cross-operator toll structure

A toll structure that is simple and seamless, making the boundaries between operators transparent.

(c) Strategic toll structure to optimize traffic fluidity

A strategic toll structure allowing efficient and flexible use of the entire network, which consists of expressways and general roads, in accordance with traffic conditions.

Of the above, the new toll system achieves principles (a) and (b).

4 Characteristics of the new expressway toll rate system

The following paragraphs describe the characteristics of the new expressway toll system in effect in the Tokyo metropolitan area since April 2016.

4.1. Unification of vehicle categories

The five vehicle categories of compact size vehicle, etc. (0.8), standard size vehicle (1.0), mid-size vehicle (1.2), large size vehicle (1.65) and extra-large vehicle (2.75) have been uniformly adopted. (The numbers in parentheses represent the ratio applied to the toll assuming the toll for standard size vehicle is set to 1. The categories will be introduced gradually on the Shuto Expressway.) In sections that previously used two or three vehicle categories, the price will go up or down according to the type of vehicle for users of those routes, but overall, the tolls have become finer-grained and fairer.

4.2. Unification of the toll rates

The new toll structures eliminates fixed fee sections in favor of a distance-based system, and the toll rate was unified to the rate that had applied to the metropolitan sections of the national expressways (36.6 yen/km). This has made previously expensive routes such as the western section of the Ken-O Expressway and the Yokohama Yokosuka Road less expensive and easier to use. Conversely, while the price of previously inexpensive routes such as the Daisan Keihin Road has increased, toll maximums and other measures to mitigate drastic changes have been applied in consideration of factors such as the impact on logistics.

Minimum (300 yen for standard size vehicle) and maximum (1,300 yen for standard size vehicle) tolls have been applied to the now distance-based Shuto Expressway tolls. In relation to the previous tolls, this makes the route less expensive over short distances and more expensive over long ones.

4.3. Tolls without boundaries set according to the start and end points

For trips that can use different routes between the same start and end points, the toll is now set based on the shortest distance between those points, regardless of the route chosen. Simply put, if the toll for a route via the Ken-O Expressway is higher than that for a route going through the city center, the toll for the former is reduced to the same amount as the toll for the latter. This decision was made in light of road traffic, environmental and other policy issues concerning the city center, as well as to avoid penalizing the use of the Ken-O Expressway.

For example, under the previous system, a trip in a standard size vehicle from Atsugi (Tomei Expressway) to Sakura-Tsuchiura (Joban Expressway) cost 3,590 yen via the Shuto Expressway (114.0 km) and 5,210 yen via the Ken-O Expressway (assuming a route from Sakai Koga interchange to Tsukuba-Chuo interchange will be in use, 154.0 km). With the unified toll rates, the Shuto Expressway route now costs 3,930 yen, while the Ken-O Expressway route costs 5,050 yen. In this case, applying the same toll for the same start and end points means that both routes cost 3,930 yen.

For a trip from Atsugi to Kuki (Tohoku Expressway), the cost for a standard size vehicle under the previous system was 3,180 yen via the Shuto Expressway (99.5 km) and 3,770 yen via the Ken-O Expressway (98.9 km).

With the unified toll rates, the Shuto Expressway route now costs 3,550 yen, while the Ken-O Expressway route costs 3,310 yen. In this case, since the toll for the Shuto Expressway route is higher, the same toll system does not apply and the toll remains unchanged. This toll structure makes it more advantageous to avoid the city cen-

ter than pass through it.

References

- (1) MLIT, http://www.mlit.go.jp/road/roadfr4_0000042.html