The design of the cover is created with inspiration obtained from the beauty of the curves of an expressway junction and *mizuhiki*. *Mizuhiki* is a Japanese traditional artwork made from thin, fine twine of *washi*, or Japanese paper. The beautifully tied knots are used to decorate gifts and are also popular motifs for hair ornaments and other accessories.
President Statement

Hanshin Expressway is one of the major traffic arteries in the Kansai urban area with a 260.5 km-long network. True to our corporate philosophy of "Pursuing More Advanced Expressway Service," we have taken various actions to ensure safety and comfort of customers, while helping improve the people’s living and the local economy in Kansai through our duty of construction and management of the traffic network.

We started a new toll system designed to help customers make a wise use of expressways as an extremely important policy for the growth of the urban areas in Kansai in June 2017. We also started construction of the extension of the Yodogawa-Sagan Route and the western extension of the Osaka Wangan Route in 2017 to eliminate the missing link in the road network in the Kansai area and promote sustainable growth of the local community as a toll road construction project in addition to construction of the Yamatogawa Route and Nishi-Semba Junction.

Since one of the main purposes of road maintenance is to ensure safe use of Hanshin Expressway by customers for many years to come, we constantly promote various measures including repair of structures, traffic safety measures, and earthquake and disaster control measures as well as elongation of the service life by large-scale renewal and repair project. In addition to these measures, we newly came up with the Customer Satisfaction Improvement Plan. Hanshin Expressway Group intends to make a greater group-wide effort for "improvement of customer satisfaction" than before so that we can make customers of Hanshin Expressway feel safety and comfort as they drive.

We developed Hanshin Expressway Group Vision 2030 in April 2016 to start a new challenge. We make an all-out Group-wide effort to act according to our basic attitude “Thoroughly stand from the customer’s viewpoint” so that we can win trust of the local community and society as a contributor to the growth of Kansai. Your continued understanding and cooperation are very much appreciated.

Kazunori Yuki, President
1. Hanshin Expressway at a Glance

Corporate History

Hanshin Expressway holds a 50-year experience in expressways management and operation. During the period of the rapid economic growth, from 1960s to 1980s, a vehicle-dominated modal shift entailed heavy chronic traffic jam in the urban area. It resulted in many negative impacts on the region’s economy and living condition. Responding to a reflection of the strong demand for a new urban expressway network in the region, the former Hanshin Expressway Public Corporation, the predecessor body of the current private company, was established.

Company Privatization in 2005

Hanshin Expressway Company Limited was founded through the national Privatization scheme in 2005 along with establishment of the other five expressway companies. Even after the shift to a private company, Hanshin Expressway continuously responds to the expectations of regional society with speed, accuracy and dynamism.

The figure above shows the basic framework of the Privatization. The expressway companies borrow funds for constructing expressways. After the completion, the expressway assets and the debt are transferred to Japan Expressway Holding Debt Repayment Agency (JEHDRAl). JEHDRAl leases the expressway assets to the companies for the operation and management. The companies collect tolls and reimburse the total lease fees during a 60-year period from 2005 to 2065.

Company Profile

Route length in service ...................................... 260.5 km
Route length under construction .......................... 34.2 km
Daily traffic volume ........................................ 757,000 trips
Annual toll revenue ......................................... JPY 186 billion
Capital .......................................................... JPY 10 billion
Employees* ..................................................... Hanshin Expressway Group 2060*1
Hanshin Expressway Co., Ltd 670
Shareholders .................................................... National Government 50% and Local Governments 50%

Hanshin Expressway Group Operation

Hanshin Expressway group consists of five subsidiaries and provides holistic expressway services as the one group. The group is working to endure quality management, efficient operation, and quick response to customers’ need with considerable expertise.
Hanshin Expressway Network

Hanshin Expressway network contributes to life and economy in Hanshin Metropolitan area

Hanshin Expressway network is three times as efficient as other general roads in the Hanshin metropolitan area in terms of handling of traffic volume. Also, Hanshin Expressway accounts for 50% of the total in the area.

Expressway structures at a glance

<table>
<thead>
<tr>
<th>Osaka</th>
<th>Hyogo</th>
<th>Kyoto</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Length (km)</td>
<td>149.1</td>
<td>101.3</td>
<td>101.1</td>
</tr>
<tr>
<td>Elevated (km)</td>
<td>141.5</td>
<td>60.0</td>
<td>7.9</td>
</tr>
<tr>
<td>Underground (km)</td>
<td>9.2</td>
<td>21.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Exit/entrance</td>
<td>138</td>
<td>39.5</td>
<td>69</td>
</tr>
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Toll

Hanshin Expressway uses a distance-based tolling system. Distance-based tolling means that there will be different tolls charged for trips of different lengths. Information services are provided through mobile devices.

Expressway structures at a glance

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Toll

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2. Main Business Domains

The business domains branch into various areas that are fundamental to provide safe and secure road services around the clock.

- **Planning**
  - General project formulation flow of urban toll roads is as follows. Until the project is designated as an urban plan and Hanshin Expressway is appointed as the project implementation entity, the due process is basically governed by the national and the relevant local governments. Hanshin Expressway assists the process by providing analysis, data and information upon request, followed by further examinations to build a concrete project plan.

- **Construction Management**
  - Supervision of contracted construction work

- **Traffic Management**
  - Provision of reliable information and traffic safety

- **Environmental Considerations**
  - Reduction of negative environmental impact

- **International Experience**
  - Technical exchanges with over 40 countries

- **Affiliate Business**
  - New fields based on the rich experience

1. **Hanshin Expressway Network Traffic Simulation**

Based on the micro traffic simulation model specified for the Hanshin Expressway network and estimated traffic demand data sets of the national level, more localized traffic flow simulation is conducted to examine expected change after the route addition. This methodology is also used for predicting the extent of effects of countermeasures on congestion-prone sections.

2. **Detailed Project Planning**

By considering the cases with different reimbursement of total project and operation cost by the total toll revenue is simulated. A reasonable combination of toll and cost is selected and refined into a concrete project plan along with the coordination for a necessary cost allocation schema between Hanshin Expressway and other governing entities. After the plan is finalized and approved by the relevant entities, the process enters the steps of agreement with the Japan Expressway Holding and Debt Repayment Agency and acquisition of project license from the national government.

3. **Project Budget Planning**

After the coordination with the relevant organization and the setting of precise project schedule, annual budget spending plan for the construction and land acquisition is finalized. Also necessary approvals are to be obtained for the work commencement.

4. **Other Responsibilities**

**[Budget Management and Project Assessment]**

The Planning Department is in charge of the management of annual operation and maintenance budget. Other responsibilities are the cost-benefit analysis of the project after the completion and the intermediate analysis during the construction when the conditions vary and the needs of revaluation arise.

**[Action Program against Congestion]**

With points and causes of chronic congestion are identified, feasible countermeasures (e.g. realignment, lane addition, traffic flow smoothing at merging and diversion points) are examined and reflected in the concrete action programs. These programs include the results of effect simulation and the budget estimation for the implementation after the approval. Due to lane addition shown on the right, congestion has decreased since the completion in 1997.
Land Acquisition and Resettlement

The Hanshin Expressway network is running through the highly dense urban area where business activities and dwellings cluster. Under such circumstances, land acquisition and resettlement is unavoidable for the expressway projects. Resettlement can certainly cause loss of land, housing, and livelihood. Hanshin Expressway identifies the project-affected person(s) (PAPs) to just compensation. Types of loss are identified by conducting a thorough survey of the subject land, property and livelihood.

Procedure of land acquisition and compensation

1. Project briefing
2. Title holders’ meeting
3. Land survey
4. Property and business/livelihood survey
5. Documentation of inventory surveys
6. Calculation of the amount of compensation
7. Individual meetings
8. Agreement and contract conclusion
9. Request and full payment of compensation

Environmental Considerations

“Environmental Friendliness” has become one of the most important key phrases and Hanshin Expressway fulfills its social responsibility as a road operator by taking various methodologies to minimize negative environmental impacts and to harmonize its structures with the roadside communities.

Noise and Vibration Reduction Measurement

Approximately 80% of the total length of the Hanshin Expressway consists of viaducts. Noise barriers or absorbers are installed to alleviate unpleasant noise caused by vehicles passing. Also, viaduct sections have numerous joints on their surfaces and they often make heavy noise and vibration when vehicles pass over. As an effective countermeasure, existing slabs are connected to eliminate joints as much as possible.

Aesthetic Considerations

Some expressway structures are beautified in order to maintain good visual harmony with surrounding landscape. Some columns above rivers are illuminated with colorful lights, while other columns are painted to match harbor areas.
Example of contract evaluation tally sheet

CEBM score = Price score + Quality Management score

Price score
- Depend on the bidding price

Quality Management score
- Technical Proposal score
- Enterprise’s Ability score
- Engineer’s Ability score + α

Appropriate cost estimation improves construction quality

“Cost estimation” is a procedure of pricing road activities to ensure uniformity in public and private procurement practice. “Client’s quoted price” is benchmark of determining contract price and identified as appropriate cost for public works calculated by “Cost estimation”.

Well performing contractor gets good contract evaluation that are reflected in the next tender

The completion inspection of the construction work is an important process to confirm and accept the total quality of construction work. Hanshin Expressway also evaluates the result of the construction work in many aspects and converts it into 1-100 score. The score is notified to the contractor and can be referred to as previous experience in the next tender.

Hanshin Expressway is responsible for supervision of contracted construction work and has developed its own managerial methods reflecting the highway owner’s points of view known through many experiences of construction projects. They are to ensure the quality and smooth and safe work execution.

CEBM enables economically and technically well-balanced contract

Financial competition used to be the only principle for public work tenders. However, awarding to the lowest bidder has the disadvantage that results in an unrealistically low price contract which cannot guarantee the quality. Furthermore, there is a risk of bid rigging by forming the participants’ cartel. Under this circumstance, Hanshin Expressway adopts comprehensive evaluation bidding method (CEBM) which is the new tender evaluation method based on the Act on Promoting Quality Assurance in Public Works enacted in 2007. CEBM converts the bidding price into score, which is combined with scores of technical evaluation. Thus, CEBM enables the fair and objective tender evaluation with balanced consideration of both bidding price and technical capacity of bidders.

Quality and work safety control guarantee good construction work performance

Hanshin Expressway’s quality inspection and safety control are conducted during the work execution period. In addition to a check of construction site conducted by contractors, Hanshin Expressway also supervises the site in line with its own specification, which accumulates the management expertise.
The primary objective of maintenance works is to keep the expressways in good condition for a long term. All structures on Hanshin Expressway are regularly inspected and monitored to identify their current soundness. After diagnosis, planning and repair design according to the inspection data followed by the actual maintenance implementation, the condition is reevaluated and the inventory database is updated. This routine management cycle enables continuous progress of maintenance strategy.

**Concept of Maintenance Management**

In order to prevent third-party disasters, on- and off-road inspection patrols are conducted daily. Comprehensive structural inspections by detailed observation of bridges from closer range are conducted basically every 5 years. Damage detected through inspections is evaluated and classified in terms of damage severity.

**Inspection and Maintenance**

Hanshin Expressway started to apply large-scale intensive repair and improvement work by all-lane closure in 1973, the first maintenance practice of its kind in Japan, and has carried it out approximately once in every year since 1985. This concept is aimed to minimize negative impacts on traffic in urban areas by concentrating all road works in a fixed short period. Major repair works include road re-pavement and expansion joint replacement. Work schedule and process coordination and management are the keys of success, and Hanshin Expressway has expertise on these know-hows.

**Re-evaluation**

The effects of repair and rehabilitation work are re-evaluated to update the maintenance plan.

**Routine maintenance**

Routine maintenance is executed in a daily basis to provide smooth and safe traffic service. Routine maintenance consists of: cleaning of road surface and drainage, and minor repair works.

**Large-scale Intensive Maintenance Work**

Concept of preventive maintenance which is adopted at Hanshin Expressway is detecting damage in an earlier stage by regular inspection and conducting simple repair at a lower cost than that required for substantial repair of serious damage. Optimal maintenance plan is proposed by evaluating structural conditions using maintenance management system which consists of Maintenance Information Management System (database system) and Hanshin Expressway Bridge Management System (asset management system).

**Effectiveness of Large-scale intensive repair work**

<table>
<thead>
<tr>
<th>Item</th>
<th>Works with partial lane closure</th>
<th>Works with all-lane closure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>9.2 billion yen</td>
<td>5.8 billion yen</td>
</tr>
<tr>
<td>Traffic congestion amount</td>
<td>6,001 km/h</td>
<td>173 km/h</td>
</tr>
</tbody>
</table>

*Repair works with traffic control are only allowed in weekends.*
Traffic Management

Traffic Control System
For over fifty years, Hanshin Expressway has been developing cutting-edge Intelligent Transportation System in order to smooth mass vehicle traffic volume in the urban area. By this continuous effort, can provide highly reliable traffic information for 24/7 basis, so that drivers can enjoy safe and comfortable driving experience on the network.

Traffic Safety Improvement
Hanshin Expressway continuously carries out many traffic safety measures at blackspots based on the Traffic Safety Enhancement Action Program formulated in 2005. Since the implementation of the program, accidents decreased by about 1,480 during the period from 2005 to 2017. A revised Action Program has been established for achieving further accident reduction.

Traffic Administration Crew / Prevention of Overloading
Well-trained crews on yellow patrol cars patrol expressway frequently. They handle traffic accidents with police officers and clear debris on the road. Also, they fill out potholes on road surface as an emergency measure with pre-packed cold mix asphalt.
Crackdowns on overloaded vehicles in cooperation with police officers are executed frequently since they may endanger traffic safety and structural healthiness of the roads. Furthermore, they could cause noise and vibration discomfort to roadside residents. In addition, with the wide use of ETC, Hanshin Expressway develops “High-precision Automatic Axle Weighing System” which is installed in all toll gates.

Affiliate Business
Domestic Road Management Business
Hanshin expressway has been awarded contracts of three road sections from municipal road administrators. Since 2009 Hanshin Expressway has been designated as the manager and operator of Osaka Sakishima and Yumesaki Tunnels owned by Osaka City and linking logistic areas of the Port of Osaka.
With rich administrative experience such as traffic control and highway facility management, Hanshin Expressway ensures tunnel safety. Hanshin Expressway is also engaged in the maintenance activities of Daimi-Hama toll road between Osaka and Nara jointly with the subsidiary company, Hanshin R&D Company Limited. The field of entrusted works is branched into maintenance, repairing, and cleaning of road surfaces and water ducts which require holistic management skills. With the expertise of Hanshin Expressway network management, it is expected to enhance efficiency and reduce the cost of operation.

Service Area Operation
Hospitality and comfort are the key concepts in service area operation; thus, its facilities are frequently renovated and changed, and its service manuals and restaurant menus are updated by reflecting customer needs which are collected regularly.
There are 4 service areas as well as 6 small rest areas with washroom facility. In service areas, variety of meals and refreshments are ready for customers and washrooms and vending machines are also provided.

Parking Lot Operation
Hanshin Expressway utilises vacant spaces under the elevated structures as toll car parkings. There are about 240 car parks in Osaka and Hyogo areas, which are operated in collaboration with the subsidiary company, Hanshin Expressway Service Company Limited.
3. Overseas expansion

Sharing technologies and know-hows of advanced highway operation and management

Hanshin Expressway has provided total expressway service for half a century, ranging from right-of-way and construction managements to operation and maintenance. Hanshin Expressway is now sharing this accumulated expertise with many countries abroad.

- **Technical Cooperation in the World**
  Based on our professional experience and human resource, Hanshin Expressway has been dispatching experts to many countries collaborating with JICA*. This has contributed to the capacity strengthening of road sectors.

  *Japan International Cooperation Agency*

- **Memorandum of Understanding (MoU)**
  Hanshin Expressway has explored a tight relationship with many countries and signed MoU with some highway administrative entities in order to keep and enhance the collaboration and deepen technical exchanges. Under the agreement, Hanshin Expressway sends experts and jointly hosts training programs and technical seminars.

- **Training Programs by Hanshin Expressway**
  Hanshin Expressway hosts many officers and engineers from highway administrative entities and provides a series of training programs, including lectures on highway operation and management and introduction of the latest technologies on ITS, construction and maintenance.

- **Consultancy Business for Highway Administrators**
  Hanshin Expressway currently expands international consulting business for highway administrators. It includes capacity building program, design assistance and establishment of manuals and systems.

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>43</td>
<td>281</td>
</tr>
<tr>
<td>2013</td>
<td>37</td>
<td>315</td>
</tr>
<tr>
<td>2014</td>
<td>32</td>
<td>171</td>
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<tr>
<td>2015</td>
<td>53</td>
<td>242</td>
</tr>
<tr>
<td>2016</td>
<td>49</td>
<td>201</td>
</tr>
<tr>
<td>2017</td>
<td>48</td>
<td>302</td>
</tr>
</tbody>
</table>

Countries where The experts are dispatched

Training Programs on Bridge Maintenance

Meeting with the local road administrators

Local seminar

Site survey