

———— JCR Green Bond Framework Evaluation by Japan Credit Rating Agency, Ltd. ————

Japan Credit Rating Agency, Ltd. (JCR) announces the following Green Finance Framework Evaluation Results.

## JCR Assigned Green 1(F) to the Green Bond Framework of Central Nippon Expressway Company Limited

Subject : Central Nippon Expressway Company Limited  
Green Bond Framework (Climate Resilience Bonds)

### <Green Bond Framework Evaluation Results>

Overall Evaluation	Green 1(F)
Greenness Evaluation (Use of Proceeds)	g1(F)
Management, Operation and Transparency Evaluation	m1(F)

### Chapter 1: Evaluation Overview

Central Nippon Expressway Co., Ltd. (NEXCO Central) is a special company wholly owned by the government. Its business base covers relatively heavy traffic routes from the Tokyo metropolitan area to Chubu and Kinki areas including the Tomei Expressway, Chuo Expressway and Shin-Tomei Expressway among the national expressway network, etc. formerly held by Japan Highway Public Corporation. NEXCO Central is primarily engaged in construction, operation and maintenance, etc. of expressways, as well as management and operations of rest areas providing services and parking lots. In line with the basic policy of group management, NEXCO Central has been grouping associated companies. They are 27 subsidiaries and 9 related companies as of March 2020.

NEXCO Central Group identifies "control of global warming and consideration for the local environment" as one of the material theme in its CSR activity. Reflecting this CSR materiality in its management plan, it stipulates environmental policy. Measures in accordance with this policy include "control of global warming," "enhancing 3R (Reduce Reuse and Recycling) of resources," and "consideration for the local environment." Management Plan Challenge V (Five) 2016-2020, the current management plan, reflects the materiality of the above CSR activities in business activities and has the following four management policies.

Management Policy 1: Continuous Efforts to Improve the Safety of Expressways and Strengthen Their Functions

Management Policy 2: Enhancement of Technology Development to Improve Safety and Comfort

Management Policy 3: Contributing to regional revitalization in view of social and economic changes

Management Policy 4: Strengthening the Management Foundation to Continue Responding to Social Needs

NEXCO Central recently established a Green Bond Framework (this Framework) to issue Green Bonds as financing for climate change adaptation projects. As a result, NEXCO Central aims to promote continuous efforts to improve the safety and to strengthen functions of expressways as set forth in Management Policy 1 in accordance with the "Recommendations of the Technical Review Committee on Long-term Conservation and Renewal of Expressway Assets" and NEXCO Central Infrastructure Long Life Plan (Action Plan). JCR evaluates whether this framework complies with the Green Bond Principles (2018 edition) and the Green Bond Guidelines (2020 edition).<sup>12</sup>

NEXCO Central limits its use of proceeds under this Framework to the following projects, which is expected to contribute to climate resilience and adaptation.

- (1) Specified renewal work (Bridges, earthwork structures (slopes))
- (2) Porous Asphalt Pavement on New Expressways

JCR confirmed that the eligibility criteria established by NEXCO Central adequately examined the risks assumed by the long-term forecasts of global warming by the end of the 21st century based on the assumption of RCP8.5, and that eligible projects has appropriate effects for the assumed risks. In addition, the businesses selected according to the applicable eligibility criteria are expected to contribute to the "development of a safe and reliable road network," which is a climate change adaptation measure for transportation infrastructures specified by the MLIT for roads. NEXCO Central prepares the project selection process, system of the management of proceeds, and the post-issuance reporting appropriately. JCR evaluates those systems are well designed and keep high transparency.

As a result, JCR assigns "g1 (F)" for "Evaluation of Greenness (Use of Proceeds)" and "m1 (F)" for "Evaluation on Management, Operation and Transparency". Consequently, JCR assigns "Green1 (F)" as an overall evaluation results to the bonds. Detailed evaluation results are discussed in detail in the next chapter.

This Green Bond Framework are considered to meet the standards for items required by the Green Bond Principles and the Green Bond Guidelines of the Ministry of Environment of Japan.

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<sup>1</sup> ICMA(International Capital Market Association) Green Bond Principles 2018  
<https://www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp/>

<sup>2</sup> Green Bond Guidelines 2020 <https://www.env.go.jp/press/files/jp/113511.pdf>

## Chapter 2: Current Status of the project on each evaluation factor and JCR's evaluations

### Evaluation Phase 1: Greenness Evaluation

JCR assigns "g1 (F)", the highest grade, to "Evaluation Phase 1: Greenness Evaluation".

Rationale: 100% use of proceeds of the bond will be allocated to a green project, considering the factors described below.

#### (1) JCR's key consideration in this factor

In this section, JCR first determine whether procurement funds have been appropriated for green projects that have clear environmental improvement effects (climate change mitigation or adaptation effects). Next, JCR assesses whether an internal department/division which is exclusively in charge of environment issues or a third party agency prove it sufficiently and have taken necessarily workaround or mitigation measures, in case of possibility on use of proceeds have negative impact on the environment. Finally, JCR confirms consistency with the Sustainable Development Goals (SDGs).

#### (2) Current status of evaluation targets and JCR evaluation

##### Overview of Use of Proceeds

##### a. On the environmental improvement effects of the project

##### <NEXCO Central's Framework for Use of proceeds>

NEXCO Central defines its use of proceeds as follows in this framework.

Eligible Green Project Classification
Eligible Project 1 Expressway Renewal Project (Bridge) Eligible Project 2 Expressway Renewal Project (earth work structure (slope reinforcement)) Eligible Project 3 Porous Asphalt Pavement on New Expressways
Eligibility Criteria
The eligible projects shall be those for which sound operations are expected to be conducted with risk verification in light of the Company's assessment standards, and shall satisfy the following eligibility criteria. (Guidelines, Plans, Agreements with the Organization, etc.) [Expressway Renewal Work] <ul style="list-style-type: none"> <li>• Recommendation by the Technical Review Committee on Long-Term Conservation and Renewal of Expressway Assets (January 22, 2014)</li> <li>• Large-Scale Renewal and Major Repair on Expressways Managed by East, Central and West Nippon Expressway Company Limited (January 22, 2014)</li> <li>• Infrastructure Long Life Plan (Action Plan) FY2014-FY2020 (MLIT, May 21, 2014)</li> <li>• Infrastructure Long Life Plan in NEXCO Central (Action Plan) (March 31, 2015)</li> <li>• Agreements on the National Expressway Chuo Expressway Fuji-Yoshida Line, etc.</li> </ul> [Porous Asphalt Pavement] <ul style="list-style-type: none"> <li>• "Technical Standards for Pavement Structure" (No. 48, No. 55, June 29, 2001)</li> <li>• Design Procedures for NEXCO Central</li> </ul>
Eligibility Criteria

- The project is expected to strengthen its disaster prevention functions by upgrading and adding strength to aging facilities in response to the expected degree of damage caused by natural disasters (typhoons, floods, storm surges, etc.) due to the effects of climate change.
- The project is expected to be resilient to extreme weather and weather disasters due to the effects of climate change.
- The environmental impact assessment and other technical surveys necessary for the implementation of the relevant construction work shall be conducted.
- Preliminary explanations to neighboring residents shall be provided, and there shall be no particular dispute.
- The look-back period for the project to be refinanced shall be one year.

#### Outlines of each project

### **[Expressway Renewal Work]**

Renovation and/or upgrades to keep the highway network function sound for a long period of time by taking necessary and effective measures from the viewpoint of minimizing the life cycle cost, preventive maintenance and performance improvement of the main body structure of the highway.

#### **Eligible Project 1: Renovation of Bridges**

(Risk)

The amount of the anti-freezing agent (sodium chloride) sprayed in winter tends to increase year by year, and in particular, the amount of spraying tends to increase in skyways portion which tend to be frozen. As a result, RC (reinforced concrete) floor slabs are damaged by salt which is included in anti-freezing agents, and deteriorations such as cracks in the underside of floor slabs occur due to corrosion of reinforcement.

(Examples of Countermeasures (Specific Construction Contents))

- Waterproofing of high-performance flooring to prevent deterioration due to permeation of water and chloride
- Replacement with more durable PC (pre-stressed concrete) floor slab

(References) Upgrade of PC Floor Plates

- Prevention of floor slab deterioration due to infiltration of water and chloride from the road surface  
The fatigue life due to the ring load of the RC slab in the dry state and the wet state is found to be about 100 times different by the previous research.  
Therefore, it makes RC floor slab waterproofing in order to prolong the life, but in the RC floor slab which has already progressed degradation, the durability cannot be expected to be improved even if the waterproofing construction is made, so that the durability improvement is coped with by replacing the RC floor slab with the PC floor slab in the large-scale renewal construction, etc..

#### **Eligible Project 2: Implementation of earthwork constructs (reinforcement of slopes)**

(Risk)

The frequency of short-term abnormal rainfall is increasing due to the climate change. It raises water levels in slopes, and causes disasters due to slope collapse

(Examples of Countermeasures (Specific Construction Contents))

- If there is a water level in the embankment or the height of the embankment is high, the drainage facility shall be improved to stabilize the embankment.
- Ground Anchor Re-Construction for stabilize the cutting surfaces for Long-Term

(Reference) Construction of embankment surfaces and cut slopes

(Particular Update Relationships of Earth Works (Drainage Grooves, Anchors, etc.))

Specified renewal projects for earthworks are to reinforce embankments and cut-outs that have collapsed, and to renew incidental facilities, based on past disaster cases.

Specifically,

- For cutting soil, the type of ground anchor with low anticorrosive property is renewed to one with high anticorrosive property.
- As for the small section drainage ditch, the drainage of the small section (inner width 180mm or 240mm) which was installed based on the design procedure before 1983 is replaced with the one of the inner width 300mm which aligns with the current standard. With this upgrade, the drainage treatment capacity is improved. In the estimation, the drainage capacity improvement of about 2 to 4 times is expected.

[Porous Asphalt Pavement]

**Eligible Project 3: Porous Asphalt Pavement on New Expressways**

(Risk)

Increase in extreme weather caused by climate change increases abnormal rainfall for a short period of time and increases the risk of accidents.

(Countermeasures (Specific Construction Contents))

Construction of Porous Asphalt Pavement with higher drain ability than conventional pavement

(References) Porous Asphalt Pavement

From 1989, the trial of drainage pavement (Porous Asphalt Pavement) as a traffic accident countermeasure in rainy weather began. In response to the confirmation of its excellent effects, it has been expanded nationwide to the present.

The Porous Asphalt Pavement ensures about 20% porosity, and if it is simply calculated in the surface layer part of 4cm thickness, it becomes  $40\text{mm} \times 20\% = 8\text{mm}$ . This means that rainwater can be stored and passed through to a rainfall intensity of 8mm/h.

It was confirmed that this storage capacity has sufficient accident reduction and durability, and this 20% is made to be porosity in the design.

**<JCR's Evaluation of the Framework>**

**i. One hundred percent of the funds will be allocated to climate change adaptation projects in the transportation infrastructure sector, and high environmental improvement effects can be expected. It also intends to contribute to the Project for Climate Change Adaptation for the Green Project Classification defined in Green Bond Principles.**

NEXCO Central decides the use of proceeds in this framework a climate change adaptation projects from infrastructure long life plan as well as Porous Asphalt Pavement with a high degree of contributions to business and robustness, which are positioned as adaptive measures to global warming. NEXCO Central identifies an adaptive project classification that is eligible for this framework by the following steps. JCR used the six steps required by Climate Resilience Principles established by Climate Bonds Initiative, an international initiative, to assess the eligibilities of the NEXCO Central's eligibility criteria as climate resilience projects.

**Principle 1. Understanding the Current Status**

**(Boundaries and interdependencies for assessing climate risks and resilience impacts)**

**Brief description of the principle:**

Clearly define the boundaries of the climate resilient investment and associated assets and activities, as well as the internal and external interdependencies between the broader system affected by those assets and activities.

JCR's evaluation on principle:

NEXCO Central first started from Sekigahara between Yokaichi of Meishin Expressways in April 12, 1964. As of March 8, 2015, when the infrastructure long life plan was established, the total length of 2,007km of expressways were open managed by NEXCO Central. However, the road length which exceeds 30 years after the opening was approximately 1,203km (about 60% of the total), and the percentage of bridges whose years after opening under severe environmental conditions was approximately 60%, such as an increase in traffic volume of heavy vehicles, an increase in the amount of antifreeze sprayed in snowy and cold regions (average amount of sprayed 33 t/km in 1989-1992, average amount of sprayed 53t/km in 1993-2012), and an increase in the number of short-time abnormal rainfall (168 times on average in 1976-1986, 226 times on average in 1999-2010). Degradation due to aging is becoming apparent. Expressways have an important role to play in emergency transportation in case of disaster. MLIT climate change adaptation plan points out the importance of the maintenance and management of highly safe and reliable road infrastructure.

## Principle 2. Physical Climate Risk Assessment Undertaken

Brief description of the principle:

Issuers must perform an assessment of the physical climate hazards to which the subject asset or activity will be exposed and vulnerable over its operating life.

Issuers should use both top down risk assessment methods using a broad range of climate models and observed data. RCP 4.5 and 8.5 emissions scenarios<sup>3</sup> should guide these top down assessments. Bottom up risk assessment methods that look at inherent system vulnerabilities in local context should also be used.

JCR's evaluation on the principle:

Japan's climate change forecasts are published regularly by the Japan Meteorological Agency as forecasts of global warming. Currently, Vol. 9 is published (Global Warming Forecast Information Vol. 9 (March 2017)). The estimation of global warming in Volume 9 is based on the assumption of RCP8.5. In addition, there are an increasing number of cases in which each prefecture independently formulates and predicts a climate change forecasting platform based on this projection, and formulates an adaptation plan to climate change in the Basic Environment Plan. The three projects covered by NEXCO Central are located to Nagano, Toyama, Ishikawa, Fukui, Gifu, Shizuoka, Kanagawa, Aichi, Yamanashi and Shiga prefectures. For these three project categories, climate risks have been verified by referring to predictions of changes in temperature, precipitation, short-time rainfall, heavy rain frequency, changes in snow fall, and changes in maximum depth of snow cover by the Japan Meteorological Agency assuming RCP8.5. Therefore, it was decided to take into account the climate trends in each region over the past 100 years and the vulnerability in accordance with the actual conditions of each region, such as the climate change adaptation plan defined by each prefecture, although the changes in weather are basically observed by the top-down method.

Eligible Project 1 is bridge renewal work in areas with high snow fall. The amount of the antifreezing agent (sodium chloride) sprayed in winter tends to increase year by year, and in particular, the amount of spraying tends to increase in skyways portion which tends to be frozen. Therefore, in the RC (reinforced concrete) floor slab, the salt damage by the anti-freezing agent progresses, and the deformation such as crack of the floor slab bottom surface is generated by the corrosion of the reinforcement, so that the repair work is carried out for the purpose of the life extension by the replacement of the RC floor slab and the change to the road surface which is difficult to be corroded for the anti-freezing agent spraying.

JCR verified the temperature change, snow fall amount change, and latest snow fall change by referring to the global warming prediction on the risk identified by NEXCO Central. According to this report, it analyzed the characteristics

<sup>3</sup> RCP (Representative Concentration Pathways) scenarios compiled by IPCC (Intergovernmental Panel on Climate Change) are scenarios that are available to many researchers and are designed to enable them to compare experimental results with each other. The Higher Reference Scenario (RCP8.5) is a scenario in which the radiative forcing continues to rise, exceeding 8.5 W/m<sup>2</sup> in 2100, and the temperature rises by about 5°C compared to pre-industrialization. For scenarios up to 2300, 12 W/m<sup>2</sup> is reached. The Medium Stabilization Scenario (RCP4.5) is a scenario in which the radiative forcing stabilizes to 4.0 5W per square meter by 2100.

of the past 100 years and found that the temperature change tended to rise from +1.2°C to +2.2°C in each prefecture, but the range of the rise was large in spring and autumn, and the winter temperature change was at most only +1.6°C in Toyama. On the other hand, it was difficult to compare the amount of snowfall since 2005, because the measurement method has been changed, but there was no prefecture in which the trend of change in the amount of snowfall has been significant since 2005. Next, looking at the deepest amount of snow fall, it was not possible to obtain a significant tendency that the amount of snow fall was decreasing as well as the amount of snow coverage. On the other hand, the heavy snowfall observed in 2014 and 2018 was probably due to the fact that the cumulus convection activity in the vicinity of Indonesia became active and the Westerlies (subtropical jet airflow) became meandering due to the impact of the La Nina phenomenon, and cold air easily flowed into the vicinity of Japan. However, many areas reached unprecedented levels in the past. In the future long-term forecast by the end of the 21st century, it is predicted that the annual snow coverage will decrease throughout Japan, but on the other hand, in some regions, such as inland Hokkaido in the severe winter season, it is predicted that the maximum snow coverage will increase. This can be attributed to the fact that the amount of water vapor in the atmosphere increases against the backdrop of rising temperatures and sea surface temperatures caused by global warming, resulting in an increase in the amount of snowfall in sufficiently cold regions even amid global warming, in addition to the fact that snowfall is sustained as snow cover. Therefore, in Northern Japan during the severe winter season, snowfall of the same level as that at present appears in the future. In addition, there have been papers showing that the frequency of extreme snowfall occasionally increases in the inland part of Honshu and Hokkaido even when global warming progresses. Therefore, it is unlikely that the use amount of the antifreezer will be greatly reduced, and it is important to apply the antifreezer and to upgrade a bridge to have sufficient toughness against heavy snow in the heavy snow area. Consequently, JCR evaluates that the climate risk of eligible project 1 targeted by NEXCO Central has been adequately verified and reflect the future weather scenario.

Next, the eligible project 2 is a construction project aimed at preventing sediment disaster by the renovation of the existing slope surface because the strength of the slope surface has been loosened. NEXCO Central aims to avoid the occurrence of disasters due to the collapse of the slope surface due to the increase of abnormal rainfall for a short period of time due to climate change, the rise of water level inside the slope surface, and the collapse of the slope surface due to the reinforcement of anchors on the slope surface and the renovation of drainage channels. The purpose of the implementation of eligible project 3 is to reduce the incidence of accidents due to short-term heavy rainfall by drainage paving.

Short-term heavy rainfall means rainfall of 30mm or more and 50mm or more per hour. According to global warming projections, in RCP8.5 scenarios, the number of occurrences of rainfall as if the bucket were flipped over (i.e., rainfall over a short period of 30mm per hour) and rainfall as if the bucket were fallen over a cascade (i.e., rainfall over a short period of 50mm per hour) increases significantly in almost all regions and seasons of Japan. Of these, the annual frequency of rainfall falling like a waterfall is more than doubled on the national average. It is also predicted that the annual maximum daily precipitation (the highest daily precipitation in one year) will also increase nationwide in the 50-year probable daily precipitation, although uncertainties associated with tropical cyclones are large and may change depending on this. 100-year stochastic daily precipitation has been shown to increase by 10% to 60% at the end of the 21st century.

Based on the foregoing, JCR has evaluated that both project 2, which aims to strengthen existing earth work structures in order to support the pressure of slopes containing a large amount of water, and project 3, drainage pavement construction, which aims to improve drain ability, are considered to be businesses to reduce the damage caused by the increase in rainfall due to the above-mentioned climate change, and that the risk is appropriately assumed.

### Principle 3. Risk reduction measures undertaken

#### Brief description of the Principle:

Demonstrate that the risks identified have been mitigated to a level such that the subject asset or activity is “fit for purpose” in the face of coming climate change over its operational life, and does no significant harm to the resilience of the system of which it is a part.

In view of future uncertainties, flexible solutions that are robust in a variety of scenarios are encouraged.



JCR's evaluation on the principle:

NEXCO Central identifies and clarifies the contents of concrete construction work for each project as the avoidance and mitigation effect of the climate risk. In addition, with regard to the possibility of negative effects on the environment, measures are disclosed the each three projects. JCR evaluates that these projects mitigate damage caused by climate risk. JCR evaluated that all three eligible projects are limited to existing road renovation or high-performance paving work on road surfaces, and that they are not likely to have a significant negative impact on the environment, such as large-scale land development. JCR evaluated that the eligible projects identified in this framework had the effect of reducing disaster risks, which have been exacerbated by climate change, by strengthening the highway infrastructure and extending the lifespan of the project.

## Principle 4. Climate resilience benefit assessment

Brief description of the Principle:

Issuers are to assess the climate resilience benefits of system-focused assets and activities and demonstrate that they are 'fit for purpose' in the sense that they significantly contribute to enhancing climate resilience at a systemic level, again with flexibility to take into account the inherent uncertainty around future climate change impacts.

JCR's evaluation on the principle:

As shown in this framework, the resilience of highways is expected to be improved as was described below. Regarding the examination of the technical standards, the "Recommendations of the Technical Review Committee on Long-Term Conservation and Renewal of Expressway Assets" and "Technical Standards on Pavement Structure" set the standards reflecting the results of the examination.

### Eligible Project 1

Prevention of floor slab deterioration due to infiltration of water and chloride from the road surface

The fatigue life due to the load on wheel of the RC slab in the dry state and the wet state is found to be about 100 times different by the previous research. Therefore, in the RC floor slab, the floor slab waterproofing is constructed in the large-scale repair business for the life prolongation, but in the RC floor slab in which the deterioration has already progressed, the durability cannot be expected to be improved even if the waterproofing work is newly enforced, and therefore, by replacing the RC floor slab with the PC floor slab, the durability can be restored, and it becomes possible to bring about the same performance as was in the beginning of the construction.

### Eligible Project 2

For cut earth, the type of ground anchor with low anticorrosive property is renewed to one with high anticorrosive property.

As for the small section drainage ditch, the drainage of the small section (inner width 180mm or 240mm) which was installed based on the design procedure before 1983 is replaced with the one of the inner width 300mm which aligns with the current standard, and the drainage cross section is enlarged, and the drainage treatment capacity is improved. In the estimation, the drainage capacity improvement of about two to four times is expected.

### Eligible Project 3

The Porous Asphalt Pavement ensures about 20% porosity, and if it is simply calculated in the surface layer part of 4cm thickness, it becomes  $40\text{mm} \times 20\% = 8\text{mm}$ . This means that rainwater can be stored and passed through to a rainfall intensity of 8mm/h.

NEXCO Central decided to ensure 20% of porosity for the porous asphalt pavement considering the past performance, its drainage ability and durability.

JCR evaluates that all of the above-mentioned climate change adaptation projects for expressway assets are appropriate measures that take into account the balance between the current state of the art and other technical characteristics, and that they fall under the category of infrastructure development projects that incorporate new technologies in response to existing infrastructure resilience and adaptation against anticipated climate change.



## Principle 5. Trade-off with climate mitigation

### Brief description of the Principle:

The need for climate change mitigation may be reduced in assets and activities aimed at disaster to climate change by virtue of resilience that can outweigh significantly relevant emissions or contribute to avoiding GHG emissions in disasters. At present, there is no consensus on what situations the trade-off between climate mitigation can be considered. In any case, however, investments in technologies such as lock-in to fossil fuels must be avoided.

### JCR's evaluation on the principle:

JCR evaluates that the eligible projects are not locked-in to fossil fuels projects, as they are the renewal and renovation of existing aging road infrastructure and the introduction of new technologies that are highly adaptable to climate change in the road infrastructure, and therefore, JCR does not anticipate a trade-off relationship with projects aimed at climate change mitigation.

## Principle 6. Monitoring and evaluation

### Brief description of the Principle:

Issuers are required to undertake ongoing monitoring of climate risks and benefits to determine whether the subject assets and activities continue to be fit for purpose and maintain any climate resilience benefits as climate risks evolve.

### JCR's evaluation on the principle:

NEXCO Central carries out two types of inspections: (1) the initial inspection which grasps the initial status after the completion of the structure, and (2) the periodical inspection which periodically grasps the status of the change of the structure in order to prevent the damage of the third party, etc. in advance, etc. according to each purpose frequency and method.

### **b. Negative impact on the environment**

NEXCO Central found that there is little possibility that each eligible project under this framework will have a material negative effect on the environment, since it is only for the renewal work of existing expressways or the work of the pavement surface of the road. Not limited to the above use of proceeds, however, it identifies the following assumed risks and mitigation measures for its business as a whole. JCR confirmed that the appropriate countermeasures are taken by hearing and confirmation of the related materials submitted from NEXCO Central.

Risks and countermeasures assumed by NEXCO Central	
(1) Impact of land development on ecosystems	<ul style="list-style-type: none"> <li>• Conduct environmental impact assessments in all expressway construction projects (carried out by the national government or target prefectures)</li> <li>• In the construction, environmental surveys such as soil surveys and hydrological surveys were carried out, and after grasping the topography, geology, groundwater conditions, etc., road structures were decided so as not to affect the life of local communities.</li> <li>• In areas rich in natural environments, the government will collect and cultivate trees that grow in local areas, and utilize them as "local saplings" for greening of highway surfaces and other areas.</li> <li>• Use soil from construction, asphalt, concrete lumps, and other construction by-products that cannot be recycled and reused as much as possible are reused as recycled resources.</li> <li>• Implemented measures against noise and air pollution in accordance with the objectives of the Basic Environmental Law and the Noise Regulation Law.</li> </ul> <p>* Noise countermeasures: Establishment of sound insulation walls and environmental facilities based on noise forecasts before construction and measurement results after construction, requests from roadside local</p>

governments, and location conditions of the facilities.

Air Pollution Countermeasures: Creation of wooden surfaces as forests, Measures against traffic congestion, etc.

**(2) Traffic congestion caused by traffic regulations and lane regulations**

- In the case of large-scale lane regulations, we will disseminate information to users through our website and public relations in advance to alleviate traffic congestion.
- Transportation impact due to construction work is reduced by implementing one-sided construction according to the restriction of traffic flow on the other side.

**(3) Safety risk of workers**

- The Company's management philosophy is to give top priority to safety, and it has decided on the Five Initiative Policies for Improving Safety as a concrete initiative policy for "Continuous Efforts to Improve Safety," one of its management policies.
  1. Fostering a corporate culture that places top priority on safety
  2. Continuous improvement of business processes in response to aging of road structures and potential risks
  3. Promotion of safety activities
  4. Developing Human Resources to Support Safety
  5. Promotion of steady and efficient business to improve safety
- Based on the above, it implements initiatives for safe and efficient construction and work together with the contractors and Group companies.
- Report the status of implementation of initiatives based on the "Five Initiative Policies" at the Safety Improvement Expert Meeting composed of external experts once a year.

**c. Consistency with SDGs goals and Targets**

JCR assessed that projects implemented through this framework will contribute to the following SDGs goals and targets with reference to ICMA's SDGs mappings.



**Goal 13: Take urgent action to combat climate change and its impacts**

**Target 13.1. Strengthen resilience and adaptive capability to climate-related hazards and natural disasters in all countries.**

## Evaluation Phase 2: Management, Operations and Transparency Evaluation

JCR assigns "m1 (F)", the highest rating on JCR evaluation Phase 2: Evaluation on Management and Operation and Transparency.

Rationale: The project has allocated the funding and implemented the businesses as planned through a firmly equipped management and operation system and high transparency as described below.

### 1. Appropriateness and Transparency concerning selection standard and processes of the use of proceeds.

#### (1) JCR's key consideration in this factor

In this section, JCR confirms that the objectives to be achieved through the green bond, the criteria for selecting green projects, the appropriateness of the process, and the series of processes are appropriately disclosed to investors.

#### (2) Current status of evaluation targets and JCR evaluation

##### a. Goal

##### <NEXCO Central's Framework for the goals>

NEXCO Central manages about 2,100km of highways such as Tomei Expressway, Meishin Expressway, and Chuo Expressway. The Tomei Expressway and the Meishin Expressway are aging, with more than 50 years from the opening of all routes, and about 60% of all routes have been in service for more than 30 years. In order to continue to play a role as an aorta supporting livelihoods and the economy, it is necessary to engage in large-scale renewal and repair projects at an early stage.

In recent years, the social environment has changed dramatically, such as frequent and severe natural disasters, a falling birthrate and an increase in aging population, a rapid decline in the labor population, and rapid technological innovation in the ICT field. As a company, how to contribute to the sustainable development of society has been questioned. Our group is continuing to take on the challenge of further heightening by working on the development of highway networks, measures against aging through renewal projects, countermeasures against toughening by earthquake-resistant reinforcement of bridges, technological development utilizing ICT, and resolves to social issues such as regional revitalization.

The Japanese government approved the Climate Change Adaptation Bill in February 2018 and promulgated it in June. The Law stipulates that the State shall formulate a climate change adaptation plan to promote adaptation to climate change in various fields such as disaster risk reduction.

The MLIT, which has jurisdiction over road administration, formulated the MLIT Climate Change Adaptation Plan in November 2018 based on the above-mentioned law, and in this plan, "Development of Higher Road Networks" was specified as an adaptation measure in roads.

In this framework, it is considered that the government's climate change adaptation plan policy of "development of safe and reliable road networks" is being followed to take drastic measures against aging of bridges, tunnels, soil structures, etc., which are structures of highways, through large-scale model update and repair businesses of highways for which funds are to be used.

##### <JCR's Evaluation of the Framework>

JCR confirmed that NEXCO Central is steadily implementing various measures in accordance with the MLIT's climate change adaptation plan, the Recommendation of the Technical Review Board on Long-Term Conservation

and Upgrading of Expressway Assets (November 2014), the Large-Scale Update and Large-Scale Repair on Expressways managed by East, Central and West Nippon Expressway Co., Ltd. (January 22, 2014), the Infrastructure Longevity Plan (Action Plan), the NEXCO Central Infrastructure Longevity Plan (Action Plan) (March 31, 2015), and the Agreement on the National Expressway Central Automobile Route Fujiyoshida Line, etc. JCR also confirmed that Project 3 was implemented based on "Technical Standards for Pavement Structure (No. 48, No. 55, June 2001)". From the above, JCR evaluates that the plans covered by this framework are consistent with the MLIT's Climate Adaptation Plan for Transport Infrastructure and the NEXCO Central's Environmental Strategy.

## b. Selection Criteria

### <NEXCO Central's Framework for Selection Standards>

Eligibility Criteria for NEXCO Central
<p>The eligible projects shall be those for which sound business operations are expected to be conducted with risk verification in light of our review standards, and shall satisfy the following eligibility criteria. (Guidelines, Plans, Agreements with the Organization, etc.)</p> <p>[Expressway renewal projects]</p> <ul style="list-style-type: none"> <li>• Recommendation by the Technical Review Committee on Long-Term Conservation and Renewal of Expressway Assets (January 22, 2014)</li> <li>• Large-Scale Renewal and Major Repair on Expressways Managed by East, Central and West Nippon Expressway Company Limited (January 22, 2014)</li> <li>• Infrastructure Longevity Plan (Action Plan) FY2014-FY2020 (MLIT, May 21, 2014)</li> <li>• NEXCO Central Infrastructure Longevity Plan (Action Plan) (March 31, 2015)</li> <li>• Agreements on the National Expressway Chuo Expressway Fuji-Yoshida Line, etc.</li> </ul> <p>[Porous Asphalt Pavement]</p> <ul style="list-style-type: none"> <li>• "Technical Standards for Pavement Structure" (No. 48, No. 55, June 29, 2001)</li> <li>• Design Procedures for NEXCO Central</li> </ul> <p>Eligibility Criteria</p> <ul style="list-style-type: none"> <li>• The project is expected to strengthen its disaster prevention functions by upgrading and adding strength to aging facilities in response to the expected degree of damage caused by natural disasters (typhoons, floods, storm surges, etc.) due to the effects of climate change.</li> <li>• The project is expected to be resilient to extreme weather and weather disasters due to the effects of climate change.</li> <li>• The environmental impact assessment and other technical surveys necessary for the implementation of the relevant construction work shall be conducted.</li> <li>• Preliminary explanations to neighboring residents shall be provided, and there shall be no particular dispute.</li> <li>• The lookback period for the project to be refined shall be one year.</li> </ul>

### <JCR's Evaluation of the Framework>

JCR evaluates the eligibility criteria set in this framework by NEXCO Central is appropriate for identifying climate change adaptation projects. In addition, it was confirmed that all of the projects covered by this bond met the selection criteria.

## c. Processes

### <NEXCO Central's Framework for Selection Process>

#### 1. Project Selection Participants

Finance Division prepares green project selection criteria in the consultation with Environment and technical planning Department and other relevant department. In addition, Expressway projects have to get an approval from MLIT and to be implemented in accordance with the agreement with the Japan Expressway Holding and Debt Repayment Agency.

#### 2. Project Selection Process

##### [Special Renewal Works]

- 1) Based on the recommendations of the Technical Review Committee on Long-Term Conservation and Renewal of Expressway Assets, which was established including outside experts, a large-scale renewal plan and a large-scale repair plan were formulated (January 2014).
- 2) Reflect the addition of special renewal works in agreements concluded with the Expressway Organization in accordance with the enforcement of the Act for Partial Revision of the Road Act, etc. (March 2015)
- 3) Based on the plan described in 1) above, the site to be constructed is selected on a yearly basis based on past disaster/repair history, inspection results, etc.
- 4) From project selected in Step 3), the Finance Division selects construction projects with large demand for funds as the target projects.

##### [Porous Asphalt Pavement]

- 1) The Minister of Land, Infrastructure, Transportation and Tourism formulated a basic plan as a "route to start construction" from "motorways to be constructed in the country" stipulated in the National Land Development Trunk Motor Road Construction Act.
- 2) Based on the basic plan, a development plan was formulated in accordance with the provisions of the National Expressway Law, and we commenced operations with a business license from the MLIT.
- 3) From project selected in Step 2), the Finance Division selects construction projects for which there is a large demand for funds as the target project.

### <JCR's Evaluation of the Framework>

As stipulated by law, the selection process of the project on the NEXCO Central is highly transparent with the involvement of the third parties.

From the above, JCR evaluates that the goals, selection criteria, and processes of NEXCO Central set forth in this framework have been appropriately established. NEXCO Central will disclose these selection standards and process to investors through documents mainly based on Final Terms or Offering Circular at the time of green bond issuance, thereby ensuring transparency.

## 2. Appropriateness and Transparency of management of the proceeds

### (1) JCR's key consideration in this factor

It is generally assumed that the management method of the proceeds varies by the issuer. JCR assesses whether proceeds procured through the issuance of green bonds are appropriated to the green projects and whether a mechanism and internal system are in place to enable easy tracking and management of the appropriation of proceeds.

JCR also attaches importance to evaluating the management and operation of the unallocated proceeds as well as to confirming that the proceeds procured from the bond will be allocated to the green projects at early stage.

### (2) Current status of evaluation targets and JCR evaluation

#### (NEXCO Central Framework for Management of Proceeds)

##### (How to Link Proceeds to Assets)

The funds are managed in an account exclusively for the green bonds. After the amount spent in the project (once paid out from our general account) is reviewed and totaled, the total amount spent in the projects is transferred from the special account to the general account.

##### (Method of Tracking and Management of the proceeds)

- The use of proceeds are credited to the bank account exclusively for Green Bond. After depositing money, the in-house system manages the total amount of proceeds and the accumulated amount of the costs, etc. spent in the subject projects (once from the general account). The accumulated expenditures are reviewed and funds are transferred from the exclusive account to the general account semiannually.
- Among the above, the Finance Division conducts fund management such as depositing money into a special account and transferring funds from a special account to a general account, and implements procedures such as keeping deposit/withdrawal statements, slips, etc. as evidence and registering them in our accounting system. On the other hand, the Accounting Division manages and scrutinizes the cumulative amount of construction costs, etc. spent on the target project, and at the same time extracts the semiannual construction completed amount of the target project from the asset system to grasp the progress status.

##### (Internal and External Audits for Tracking Management)

- Deposit control to and from the account shall be done by the manager of the Finance Division, who is responsible for the accounts.
- The balance of the account as of the end of the term is the document related to its balance sheet, so it is confirmed by an audit firm when closing the account semiannually.

##### (Method of Management of Unallocated proceeds)

Until the full allocation, unallocated proceeds will be managed in cash or cash equivalent.

#### <JCR's Evaluation of the Framework>

The use of proceeds set forth in this Framework is a new investment in green eligible projects as set forth in this Framework and will not be allocated for any other purpose.

NEXCO Central clearly distinguishes green bond usage from other uses by managing the funded resources with dedicated accounts. After depositing funds in the exclusive account, funds are transferred to the general account after

examining the expenditure type amount for each subject project, and the semiannual construction volume of the subject project is extracted from the asset system and efforts are made to grasp the progress status, and a strict tracking management system is established. In addition, the internal control system has been appropriately established because the chief of the Finance Division, who is the chief accountant, is to manage the entry and exit of procured funds, and the audit corporation is scheduled to obtain confirmation at the time of the semiannual settlement of accounts.

Based on the above, JCR evaluates that the NEXCO Central has established a strict funding control system and internal control system.



### 3. Reporting

#### (1) JCR's key consideration in this factor

In this section, JCR evaluates whether the disclosure system for investors, etc. before and after the issuance of green bonds is planned in a detailed and effective manner at the time of the issuance of green bonds

#### (2) Current status of evaluation targets and JCR evaluation

##### (NEXCO Central Framework for Reporting)

##### 1. Reporting on the Status of Capital Allocation

- The proceeds are expected to be used in accordance with the large-scale renewal and new construction business plan described on the website after the proceeds have been received.
- If it is necessary to reallocate the redemption of Green Bonds due to the suspension of a large-scale renewal or new pavement surface construction project, it plans to disclose the outstanding of unallocated amount on its website on an annual basis until it is reallocated for other large-scale renewal or new construction projects.
- It plans to disclose the amount of funds on its website annually.
- NEXCO Central will receive a review of the evaluation of green bonds by JCR until the bonds are redeemed, focusing on the status of the allocation of the funds and the status of reporting on the disclosure of environmental improvement effects.

##### 2. Reporting on environmental improvement effects

- NEXCO Central plans to disclose the reporting on its website annually.

##### [Output Indicators]

- Overview of the large-scale renewal and repair projects to be covered
- Extended kilometers for large-scale renewal and repair projects
- Extended kilometers in the high-performance pavement business

##### Outcome Indicators

##### Project 1: Bridge

The soundness of the bridge is recovered by the floor slab replacement, and the resilience of the bridge will be recovered to the conditions which was effected in the beginning of the construction.

##### Project 2: Earth Works Structures

Improvement of drainage capacity by about two to four times through construction such as replacement of drainage ditches.

Re-installation of ground anchors on cut slopes restores soundness and prolongs product life.

##### Project 3: High-Performance Pavement

Water penetration amount per hour (8mm/h after construction)

##### [Impact]

In response to natural disasters (storm and flood disasters) resulting from climate change that adversely affect the transportation infrastructure as envisioned in the MLIT's Climate Change Adaptation Plan, efforts should be made to strengthen the transportation infrastructure and maintain a safe and reliable transportation network.

## <JCR's Evaluation of the Framework>

### a. Reporting on the proceeds allocation

The use of proceeds will be disclosed to investors on the website of NEXCO Central, JCR evaluation report, etc. in the above framework. Methods of disclosing the allocation status and management of unallocated funds are also appropriately planned.

### b. Impact Reporting

NEXCO Central plans the impact reporting appropriately through three steps of impacts, which is recommended in GBP: Output, Outcome and Impact. The total extension distance of roads where the adaptive project was conducted is shown as an output indicator, and the content of functional recovery and improvement by the project is set as an outcome index.

JCR evaluates that the above reporting is planned to be disclosed appropriately to investors, in terms of both the allocation of proceeds and the impacts on environment.












## 4. Organization's environmental efforts

### (1) JCR's key consideration in this factor

In this section, JCR evaluates whether the issuer's management positions environmental issues as a high priority management issue, and whether the green bond policy, process and the criteria for selecting green projects are clearly defined through the establishment of a department specializing in the environmental field or through the assistance of external organizations.

### (2) Current status of evaluation targets and JCR evaluation

NEXCO Central listed "Prevention of Global Warming and Considerations for Regional Environments" as one of the materiality of its CSR activities. The CSR-related priority themes are reflected in management plans, environmental policies are established, and measures in line with these policies include "control of global warming," "Enhancing 3R of resources," and "consideration for the local environment." NEXCO Central tries to consider the environment of the earth through business activities, such as reducing CO2 emission, promoting recycling of waste materials, and creating eco-roads that are environmentally friendly.

NEXCO-Central's CSR Materiality	SDGs Target
<p><b>Developing safe, reliable and sustainable social infrastructure</b></p> <ol style="list-style-type: none"> <li>1) To realize high quality reliable and resilient road infrastructure</li> <li>2) To strengthen resilience and adaptation ability against natural disasters</li> <li>3) To enhance technical development and innovation</li> <li>4) To consider the needs of elderly, disabled, women and children</li> <li>5) To respond to aging infrastructure, improve the safety</li> <li>6) To efficient use of road infrastructure</li> <li>7) To reduce death and injured people from the traffic accidents</li> <li>8) To utilize the knowledge and experiences of maintenance for other infrastructure</li> </ol>	 
<p><b>Support for development of sustainable city and regional communities</b></p> <ol style="list-style-type: none"> <li>1) To support good connection between city and region</li> <li>2) To support revitalization of industries and tourism</li> </ol>	 
<p><b>Control of global warming</b></p> <ol style="list-style-type: none"> <li>1) Control global warming</li> <li>2) Enhancing resource 3R</li> <li>3) Consideration of environments</li> </ol>	    
<p><b>Strengthen the governance and internal control reliable from the society</b></p> <ol style="list-style-type: none"> <li>1) To foster corporate culture with high moral</li> <li>2) Appropriate response to social needs</li> <li>3) Transparency and improvement of productivity</li> </ol>	 

(Source: NEXCO-Central Annual Reports (Japanese version))

Regarding the CSR enhancement system, Executive Committee, which is composed of top management members, discusses CSR issues together with management plan to progress its CSR strategy in an integrated manner. "Management Plan Challenge V (Five) 2016-2020" reflects the priority themes of the above CSR activities in business activities and has the following four management policies.

Management Policy 1: Continuous Efforts to Improve the Safety of Expressways and Strengthen Their Functions

Management Policy 2: Promotion of Technology Development to Enhance Safety and Comfort

Management Policy 3: Contribute to regional revitalization with a view to social and economic changes

Management Policy 4: Strengthening the Management Foundation to Continue to Respond to Social Needs

NEXCO Central discloses the progress of its management plan in its annual report. In addition to receiving advice from external experts on the content and disclosure methods of the plan, when formulating the next management plan starting from the next fiscal year, the company plans to hear opinions from external experts on the social role they expect of NEXCO Central Group, and confirmed that it is formulating policies in cooperation with external experts on its own initiatives.

NEXCO Central has actively made commitments to external initiatives. In July 2008, NEXCO Central participated in the Global Compact Network Japan (GCNJ) in support of the 10 principles proposed by the United Nations Global Compact, which consist of the four areas of human rights, labor, environmental protection, and anti-corruption.

NEXCO Central operates an environmental management system and got a certification of ISO14001. In addition, the CEO gives instructions on the plans for environmental management for the new fiscal year in the management review, and the top management promotes environmental management. Plans for the new fiscal year are reported to the Management Committee and disseminated as the Company's plans.

Regarding environmental issues, there is an Environment and Technology Planning Department as a department that decides policies for implementation of environmental impact assessments and environmental measures. In addition, as a department that manages occupational safety and other relevant matters related to the safety comprehensively, it has a special department called the Comprehensive Safety Promotion Department. NEXCO Central has human resources with expert knowledge on the environment and occupational safety, and when selecting these eligible projects, the selection criteria were made reflecting these experts' opinions.

Based on the above, JCR confirmed that NEXCO Central is implementing various initiatives together with various stakeholders under the strong initiative of management. JCR also confirmed that it had specialized departments and personnel on the environmental and safety aspects of highways, and was confirmed to be involved in the implementation of eligible projects from expert knowledge.

■ Evaluation result

Based on the JCR Green Finance Evaluation Methodology, JCR assigned "g1 (F)" for "Green Evaluation (Use of Proceeds)" and "m1 (F)" for "Management, Operation and Transparency Evaluation". Consequently, JCR assigned "Green 1 (F)" as an overall evaluation. The framework meets the standards for the requirements of the Green Bond Principles and the Green Bond Guidelines (2020 Edition) issued by Ministry of Environment Japan.

[JCR Green Bond Framework Evaluation Matrix]

		Management, Operation and Transparency Evaluation				
		m1(F)	m2(F)	m3(F)	m4(F)	m5(F)
Greenness Evaluation	g1(F)	Green1(F)	Green2(F)	Green3(F)	Green4(F)	Green5(F)
	g2(F)	Green2(F)	Green2(F)	Green3(F)	Green4(F)	Green5(F)
	g3(F)	Green3(F)	Green3(F)	Green4(F)	Green5(F)	Not qualified
	g4(F)	Green4(F)	Green4(F)	Green5(F)	Not qualified	Not qualified
	g5(F)	Green5(F)	Green5(F)	Not qualified	Not qualified	Not qualified

■ Subject

Issuer: Central Nippon Expressway Company Limited

[Assignment]

Subject	Evaluation
Green Bond Framework	JCR Green Bond Framework Evaluation: Green 1 (F) Greenness Evaluation:g1(F) Management, Operation and Transparency Evaluation :m1(F)

Analysts in charge of this evaluation: Atsuko Kajiwara and Kosuke Kajiwara

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## Important Explanation of the Green Bond Framework Evaluation

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### 1. Assumptions, significance, and limitations of JCR Green Bond Framework Evaluation

JCR Green Bond Framework evaluation, which is granted and provided by Japan Credit Rating Agency, Ltd. (JCR), covers the policies set out in the Green Bond Framework, and expresses the overall opinion of JCR at this time regarding the appropriateness of the Green Project as defined by JCR and the extent of management, operation and transparency initiatives related to the use of proceeds and other matters. Therefore, it is not intended to evaluate the effects of specific environmental improvements, management and operation systems, and transparency of individual bonds and borrowings, etc. to be implemented based on these policies. In the event that an individual bond based on this framework is subject to a green bond evaluation, it is necessary to conduct a separate evaluation. In addition, JCR Green Bond Framework evaluation does not demonstrate the environmental improvement effects of individual bonds issued under this framework, and does not assume responsibility for environmental improvement effects. In principle, JCR does not directly measure the environmental improvement effects of funds procured under the Green Bond Framework, although JCR confirms the quantitative and qualitative measures by the issuer or a third party requested by the issuer.

### 2. Methodology used to carry out this evaluation

The methodologies used in this evaluation are described in "JCR Green Finance Evaluation Methodology" on the "Sustainable Finance ESG" section of the JCR website (<https://www.jcr.co.jp/en/>).

### 3. Relationship with Credit Rating Business

The act of granting and providing an evaluation of JCR Green Bond Framework is conducted by JCR as an ancillary business and differs from the act related to the credit rating business.

### 4. Relationship with Credit Ratings

This evaluation differs from credit ratings and is not intended to not promise to provide or make available for inspection a predetermined Credit Rating.

### 5. Independence of JCR Green Bond Framework Evaluation

There are no capital relationships or personnel relationships that could cause any possibilities of conflicts of interest between the subject party and JCR.

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#### ■ Glossary

JCR Green Bond Framework Evaluation: The extent to which the funds procured through green bonds are allocated for green projects as defined by JCR, and the degree to which the management, operation, and transparency of the green bonds are managed. Evaluations are performed on a 5-point scale, from the top using the Green1 (F), Green2 (F), Green3 (F), Green4 (F), and Green5 (F) symbols.

#### ■ Status of Registration as an External Evaluator of Green Finance

- Ministry of the Environment's external green bond reviewer registration
- ICMA (registered as an observer with the International Capital Markets Association)
- Members of the Working Group on UNEP FI Positive Impact Finance Principles
- CBI Approved Verifier

#### ■ Other status of registration as a credit rating agency, etc.

- Credit Rating Agency Commissioner (Rating) No. 1
- EU Certified Credit Rating Agency
- NRSRO: JCR is registered in the following 4 classes of 5 credit rating classes (as defined by the NRSRO (Nationally Recognized Statistical Rating Organization of the U.S. Securities and Exchange Commission): (1) Financial institutions, broker-dealers, (2) insurance companies, (3) general business corporations, and (4) governments and municipalities. If we are subject to disclosures under Rule 17g-7(a) of the U.S. Securities and Exchange Commission, such disclosures are attached to news releases appearing on the JCR website (<https://www.jcr.co.jp/en/>).

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