

PROGRESS REPORT OF SEISMIC EVALUATION AND RETROFIT OF OLD BUILDINGS LOCATED ALONG THE SPECIFIC EMERGENCY TRANSPORTATION ROADS IN TOKYO

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Introduction

More than 20% of earthquakes measuring magnitude 6 or stronger have been recorded in Japan, which comprises only 0.25% of the Earth's landmass.

There is a high possibility that **the Capital Tokyo** will be struck by a big earthquake, the Government's Earthquake Research Committee compiled a report that predicts that the probability of occurring earthquake is 70% on areas around Tokyo between 30 years from 2007.



17th U.S.-Japan-New Zealand Workshop on the Improvement of Structural Engineering and Resilience

Introduction

Japanese seismic codes were revised fundamentally in 1981.

There are currently known facts that old buildings constructed before 1981, which is called an **old seismic building**, had emerged as poor seismic performance on previous earthquakes.

The owners of old buildings should carry out **seismic evaluation**, **seismic retrofit design** and **retrofit renovation**.



17th U.S.-Japan-New Zealand Workshop on the Improvement of Structural Engineering and Resilience

Introduction

Tokyo will host the Olympic games in July 2020, many people will visit Tokyo from Japan and abroad.

Tokyo have the responsibility to secure many people against attack by earthquakes until **TOKYO 2020**.



0. Seismic Adequacy of Old Buildings in Japan

In Japan, there was the Act for Promotion of Rehabilitation for Earthquake-Resistant Structures, which was enacted based on **the lesson from the Kobe Earthquake of 1995**.

The purpose of this law is to protect **the lives, bodies** and **property of citizens** from being damaged such as collapse of building by earthquakes, and to improved safety of buildings with facilitating seismic retrofit renovation of old buildings, thereby contributing to improvement of public welfare.



1.1. Specification of Emergency Transportation Roads

Tokyo Metropolitan Government set

“Seismic Retrofit Promotion Plan of Tokyo”

to promote retrofitting buildings located along emergency transportation roads in Tokyo.

Basic philosophy :

“Realization of the safest and the most secure city Tokyo in the world, for big earthquakes”



17th U.S.-Japan-New Zealand Workshop on the Improvement of Structural Engineering and Resilience

1.2. Purpose of This Law

to maintain **the function** of Capital
to protect **the lives, bodies** and **property**
of citizens

from being damaged by earthquakes
directly under areas around Tokyo



1.2. Purpose of This Law

Emergency transportation roads are key to sustain escape, firefighting, rescue operations, emergency medication, transportation of emergency relief supplies and recovery and rehabilitation activities just after earthquake.

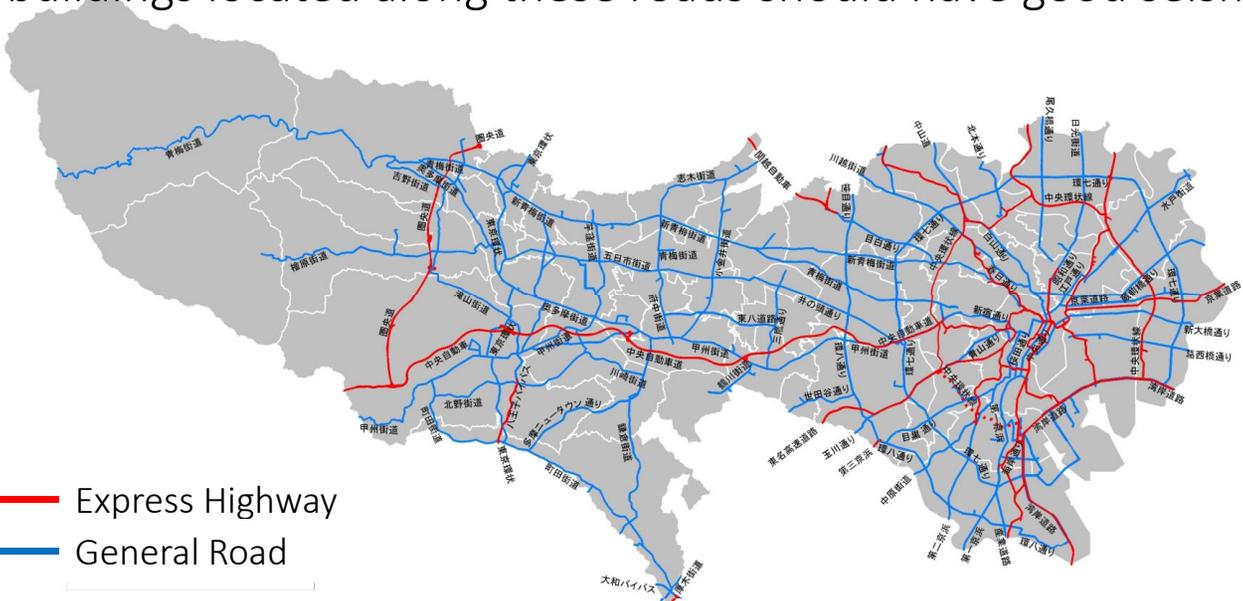
With proceeding seismic retrofit renovation of old buildings located along the roads, we can secure the function of Capital.



1.3. The Specific Emergency Transportation Roads

Tokyo Metropolitan Government officially designated 1000 km as for the specific emergency transportation roads from total of 2000 km.

These roads lead up to key harbor, airport, Tokyo Metropolitan Government headquarters and disaster prevention center to play a central role of emergency measure, and buildings located along these roads should have good seismic capacity.



1.4. Purpose of Rate of Seismic Buildings

Rate of seismic buildings =

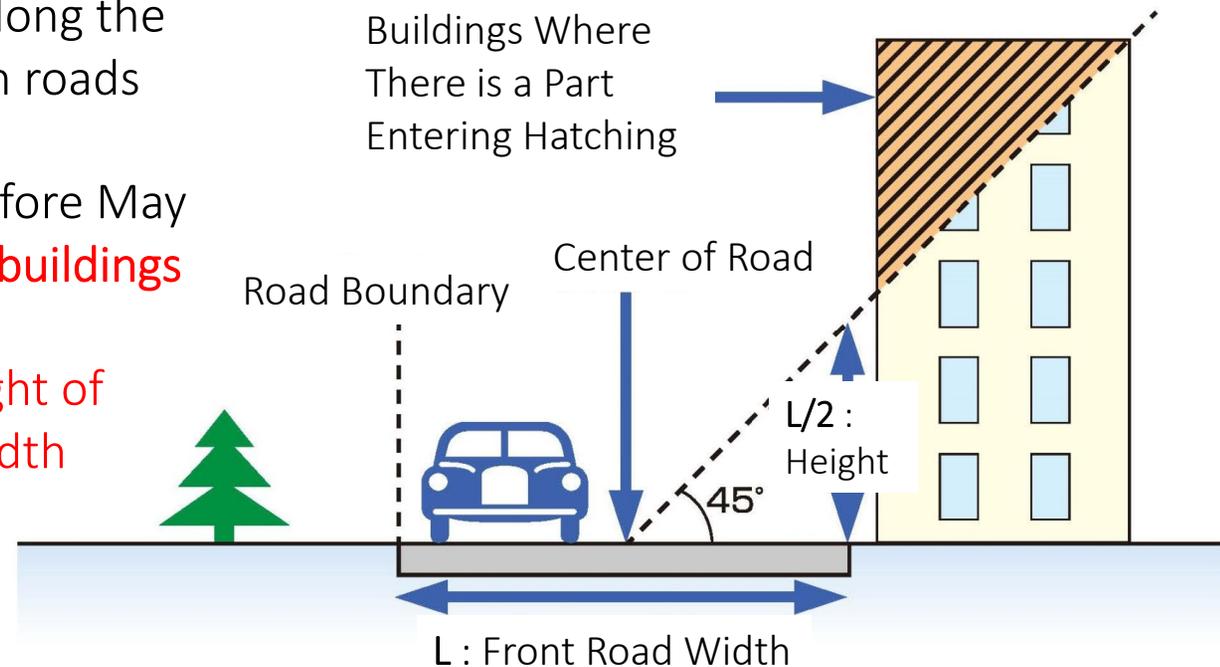
(buildings by the new standards + seismic buildings by evaluation + seismic buildings by retrofit)

All Buildings

Time	March 2020	March 2026
Numerical Target	90% as rate of seismic buildings and to minimize buildings of high-risk collapse	100% as rate of seismic buildings
Attitude	Accessible state to destination such as local disaster prevention base from outside Tokyo by taking a detour , through the specific emergency transportation roads just after earthquake	Accessible state at the shortest distance through the specific emergency transportation roads just after earthquake

1.5. Buildings located along the specific emergency transportation roads

- #1 The buildings which are located along the specific emergency transportation roads
- #2 The buildings which were built before May 1981, what are called **old seismic buildings**
- #3 The buildings which have **the height of about half or more of the road width**



1.6. Third Phases of Duty to Owner

Phase 1 Duty to **report**

Owners have duty to report about **implementation status** of seismic evaluation and retrofit renovation.

Phase 2 Duty to **carry out**

Owners have duty to carry out **seismic evaluation**

Phase 3 Duty to **effort**

Owners have duty to effort of **seismic retrofit renovation**, if buildings have not good seismic performance

1.7. Agreement on Cooperation with the Concerned Organizations

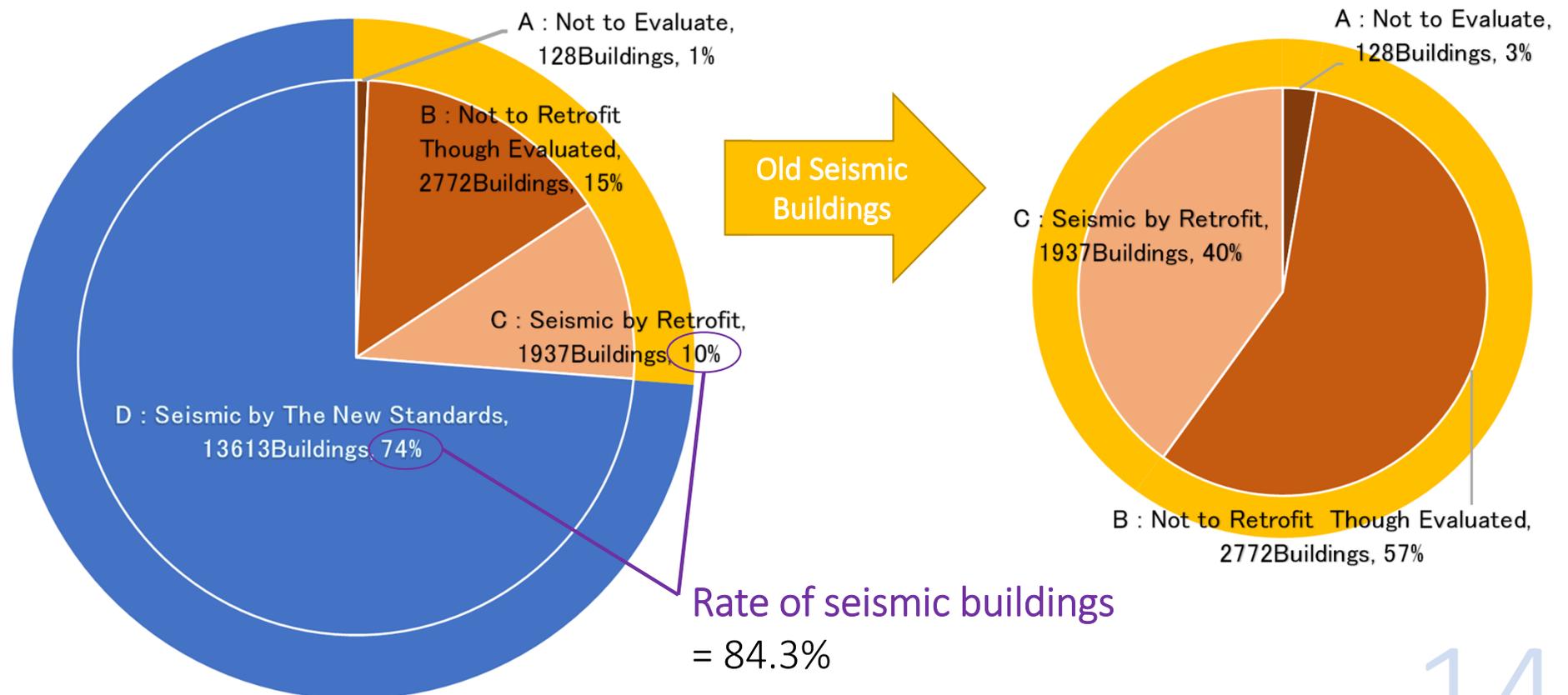
The Metropolitan Government has concluded an agreement on **cooperation** with the concerned three organizations, for the supporting system to owners.

The Japan Structural Consultants Association as **JSCA is one of them**, which has cooperated in rating for seismic evaluation of these old buildings.

2. Progress Data Report

This is new report about seismic state in **June 2018**

The data is referenced from **“Tokyo Seismic Portal Site”**

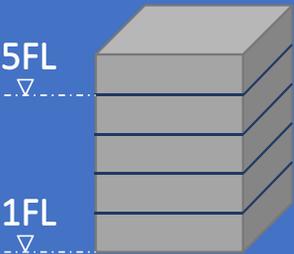
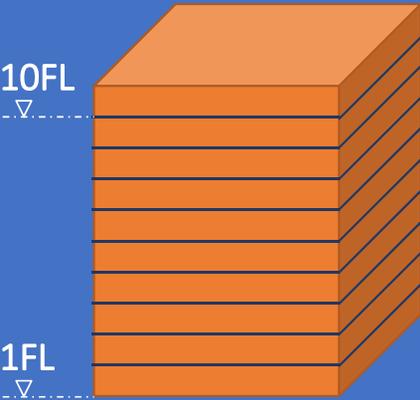


3.1. Public Financial Support of Seismic Evaluation

Period: The financial supports **basically have finished** by 2016, but some are effective **until March 2019**

Rate : **Full** amount in some cases

Example of public financial support

Diagram		
Building use	Office	Condominium
Story	5 stories	10 stories
Total floor area	500 m ²	1500 m ²
Subsidy	1,800,000 JPY	4,115,000 JPY
	16,000 USD	37,000 USD
	24,000 NZD	55,000 NZD

4. Investigation Technique for the Case of Reinforced Concrete Buildings

If building's design drawings are lost for old buildings

Engineers investigate present of state including shape of buildings by

- Span and Story Height
- Seismic Elements of Column, Girder and Wall
- Structural Plans
- Reinforcing-Bar Arrangement of Typical Members
- Concrete Compressive Strength by Cylindrical Test Piece taken off over three pieces per each floor

Engineers must restore to revised structural drawing, get the minimum information for seismic evaluation.

Investigation by Non-Destructive Test



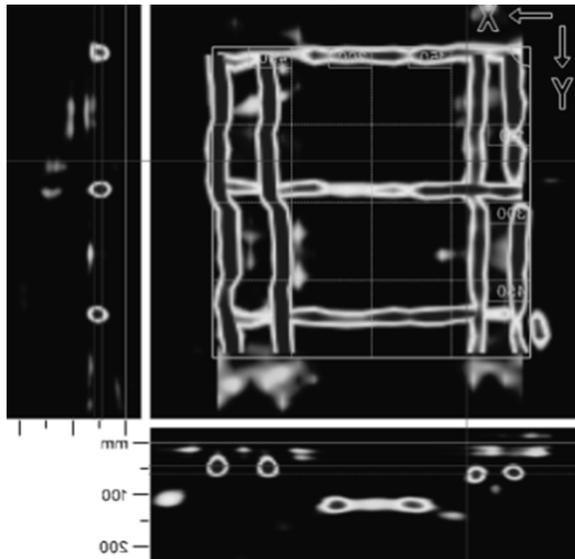
Engineers Investigate



By Radar with Electromagnetic Wave



Investigation by Non-Destructive Test



→ Turn Out The Number of Main Rebar,
and Pitch of Hoop



Marking of Rebar Arrangement



Investigation by Destructive Test



Inspection	Estimation
<p>Main Rebar X:6本,Y:3-D25 Hoop @93~105</p>	<p>Main Rebar X:6-D25,Y:5-D25 Hoop D13@100</p>

➔ Hollow with Core Boring Machine

➔ Turn Out the Diameter and Material of Rebar



5. Feedback for Citizens

The Metropolitan Government operates the website
“Tokyo Seismic Portal Site”

They expect that **owners** get **notices** and **initiatives**, by wide announcements of this information, which have serious effects on rescue operations, emergency medication, transportation of emergency relief supplies at earthquake.

The site has given a **public notice** of the numbers of building located along the specific transportation roads which has not carried out seismic evaluation, and **names** and **addresses** of buildings against owners who have not proceeded out seismic evaluation for no justifiable reason.

The names and addresses will be deleted, when The Metropolitan Government recognizes that the owners made a start on seismic evaluation.

Tokyo Seismic Portal Site

東京都耐震ポータルサイト
Tokyo earthquake-resistant portal site

Language: The Tokyo Metropolitan Government Building overall website

Site map

Why, seismic retrofitting? | The seismic retrofitting I'll advance | Seismic retrofitting subsidy system | Match in Tokyo | Seismic retrofitting info

いっかくる 首都直下地震に そなえて

進めよう 耐震化!

耐震診断結果の公表 | ブロック塀の安全点検等

なぜ耐震化 | 進めよう耐震化 | 耐震化助成制度 | 東京都の取組

New Information | November 5, 2018 | Topics | The buildings located alongside certain emergency transportation routes...

耐震キャンペーン 2018年度 TOKYO

特定緊急輸送道路図

Provide Against Earthquake at Some Future Point!

Seismic Retrofitting Subsidy System

Tokyo Efforts

Public Announcement of Results of Seismic Evaluation

Why Seismic Retrofitting?

Go Forward with Seismic Retrofitting!

Seismic Forum

2018年度 耐震キャンペーン
～首都圏下地震への備え～

耐震フォーラム

10月12日(金) 13:00~16:30
東京都議会議事堂1階 都民ホール

※第1部前期に小池都知事挨拶予定

第1部「大地震から命を守る」



新着講演
次の震災について本当のことを話してみよう。
講師: 荒井 健二 氏
(国土省大規模地震対策センター 長 兼 代表)
「いつか来るかもしれない」のではなく、「必ず来る」前提でどう地震に備えて、「見たくもないもの」を見る。そして、命の保護を図るために「何をしたらよいのか」を考える。



第2部
震源地直下・直下マンション救助活動
講師: 吉本 隆樹 氏
(国土省消防庁 消防防災課 警備部長 兼 代表)
平成28年(2016年) 震源地直下で実際に救助活動に協力された消防士の体験談を聞き、大地震から命を守ることに備える。

第2部「実践&実践! 建築物の耐震化」

体験しよう

運動実験! ぶるる
講師: 荒井 健二 氏
(国土省大規模地震対策センター 長 兼 代表)
地震時の揺れについて、実際に用いた実験を来場者が直接体験する。



質疑

いくらかかるの? 耐震化 ～助成制度と成功事例～
講師: 吉本 隆樹 氏
(国土省消防庁 消防防災課 警備部長 兼 代表)
助成制度の活用により、建物所有者の負担はどれくらい軽減されるのか、耐震化の成功事例とともに具体的な紹介する。

震源地直下の区、フォーラムに
参加しよう

お問い合わせ・お申込み ▶ 2018年度耐震キャンペーン事務局
(受付時間 9:00~18:00/土日祝日受付不可) 開催期間 2018/7/29~2018/12/14
TEL_03-6261-8804 FAX_03-6303-0886 E-mail hwano@tipeast.co.jp



東京都主催

Seismic Renovation Bus Tour

2018年度 耐震キャンペーン
～首都圏下地震への備え～

防災体験・耐震改修バスツアー

参加無料

A
コース



9月21日(金) 11:45~17:50(予定)
定員:30名
東京駅~東大地震研究所~
荻窪コーエイマンション~荻窪駅

B
コース



10月27日(土) 12:00~17:50(予定)
定員:20名
立川駅~立川防災館~
ライオンズマンション三鷹~三鷹駅

C
コース



11月9日(金) 11:45~17:50(予定)
定員:20名
東京駅~清水建設技術研究所~
新橋駅前ビル~新橋駅

D
コース



12月7日(金) 11:45~18:00(予定)
定員:30名
東京駅~東大地震研究所~
ライオンズマンション新小岩第2~東京駅

お申し込みは裏面! ▶▶▶
◆各コースの耐震改修事例の見学先で、全建物所有者、耐震改修工事の携った施工業者等による耐震改修の説明会を行います。詳しくは東京建設ポータルサイトをご覧ください。

お問い合わせ・お申込み ▶ 2018年度耐震キャンペーン事務局
(受付時間 9:00~18:00/土日祝日受付不可) 開催期間 2018/7/29~2018/12/14
TEL_03-6261-8804 FAX_03-6303-0886 E-mail hwano@tipeast.co.jp



東京都主催

6.1. New Approach ; Visualization

The construction site has display of
“Under Retrofit”.

The Metropolitan Government expects
the momentum for retrofit renovation
will grow, by **citizen’s attention** on the
sign of progressing condition of retrofit
renovation **on a daily basis**.

Under Retrofit



6.2. Door-to-Door Campaign

The Metropolitan Government have tried to spread the importance of retrofit renovation and the subsidy system.

The Metropolitan Government have made **door-to-door visits** to owners who have not carried out retrofit renovation after seismic evaluation after June in 2016, in cooperation with the municipality and the concerned organizations.

As a result, the various reasons are recognized why the seismic retrofits have not being proceeded by uses or ownership patterns.

These reasons include **the construction cost** and **decline in building functions, stagnation by lack of knowledge** how to proceed, and **non-cooperation of tenants**.

6.3. Creation and Proposal of Committee

The Metropolitan Government created **the committee** up for promotion of retrofit renovation.

They revealed **the need for acceleration** of retrofit renovation and proposed specific promotions, based on the result of door-to-door campaign.

These promotions include that **public announcement** of building name, **new responsibility** for owners, **supporting measures for building possessors** such as lessee or tenant, in addition to owners.

Measures for possessors have never happened before and shall be **new steps**.

7. Reference of approach outside of Tokyo

Tokyo and the surrounding region have just started discussing about establishment the consultative organization in which carry out to retrofit buildings located along emergency transportation.

Osaka Prefectural Government specified the roads distance of 260 km in 2013, as to proceed to retrofit renovation on a priority basis for to secure the functionality when earthquake is occurred, just like Tokyo.

Ministry of Land, Infrastructure, Transport and Tourism in Japan summarizes that the backward situation of the seismic assessments results of large-scale buildings is obliged by the seismic promotion law. Of the total of 10,600 prefectures, there were about 1,000 buildings with a seismic intensity of 6 or more and high risk of collapse, and about 700 buildings with a risk of collapse were found. About 100 buildings were reported as yet unreported.

Conclusion

The rate of seismic buildings is 84.3% in the end of June 2018.

The number of seismic buildings is certainly increased more than our previous report, but seismic retrofit renovation is not over yet although 6 years have passed.

Many seismic evaluations and retrofit renovations do not proceed so much on short period.

We must keep up proceeding to retrofit, therefore to protect the lives, bodies and property of citizens from earthquake and to secure the building's functionality.

We hope that Tokyo Metropolitan Government shall lead for any further cooperation with the municipality and the concerned organizations, proceed to retrofit buildings located along the emergency transportation roads as fast as possible and produce a steady progress of successful results for resilient Tokyo.

Thank you for your attention

3.2. Public Financial Support of Seismic Retrofit Design

Period: Necessary to **undertake** by March 2019

Rate : **Full** amount of seismic retrofit design in some cases

3.3. Public Financial Support of Seismic Retrofit Renovation

Period: Necessary to **start seismic retrofit design** before March 2019

Rate : **90%** of amount in some cases

3.4. Tax Incentive

Owners (finished retrofit renovation of certain conditions are filled)
can get tax incentive

