

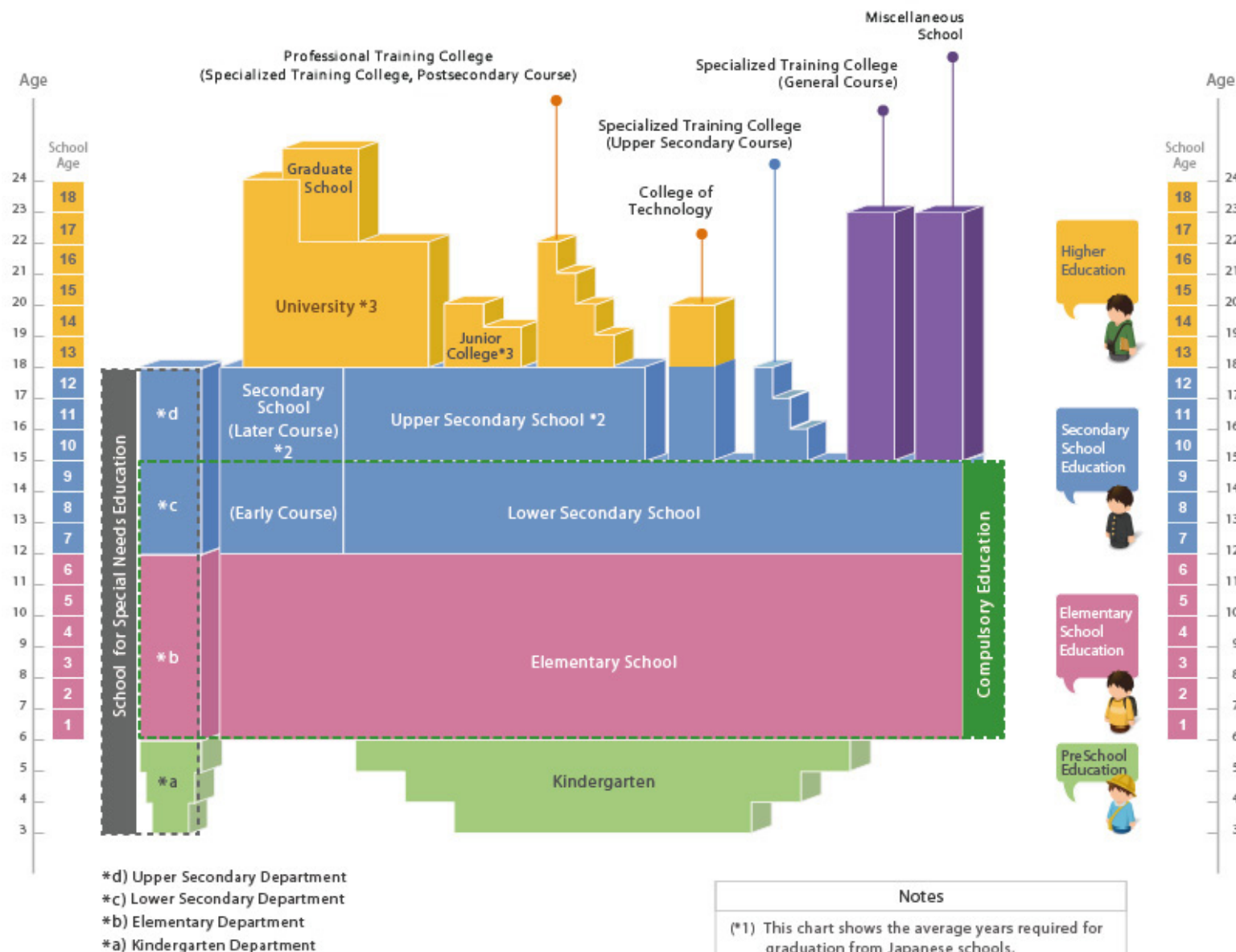
Promoting Earthquake-Resistant School Facilities

2016

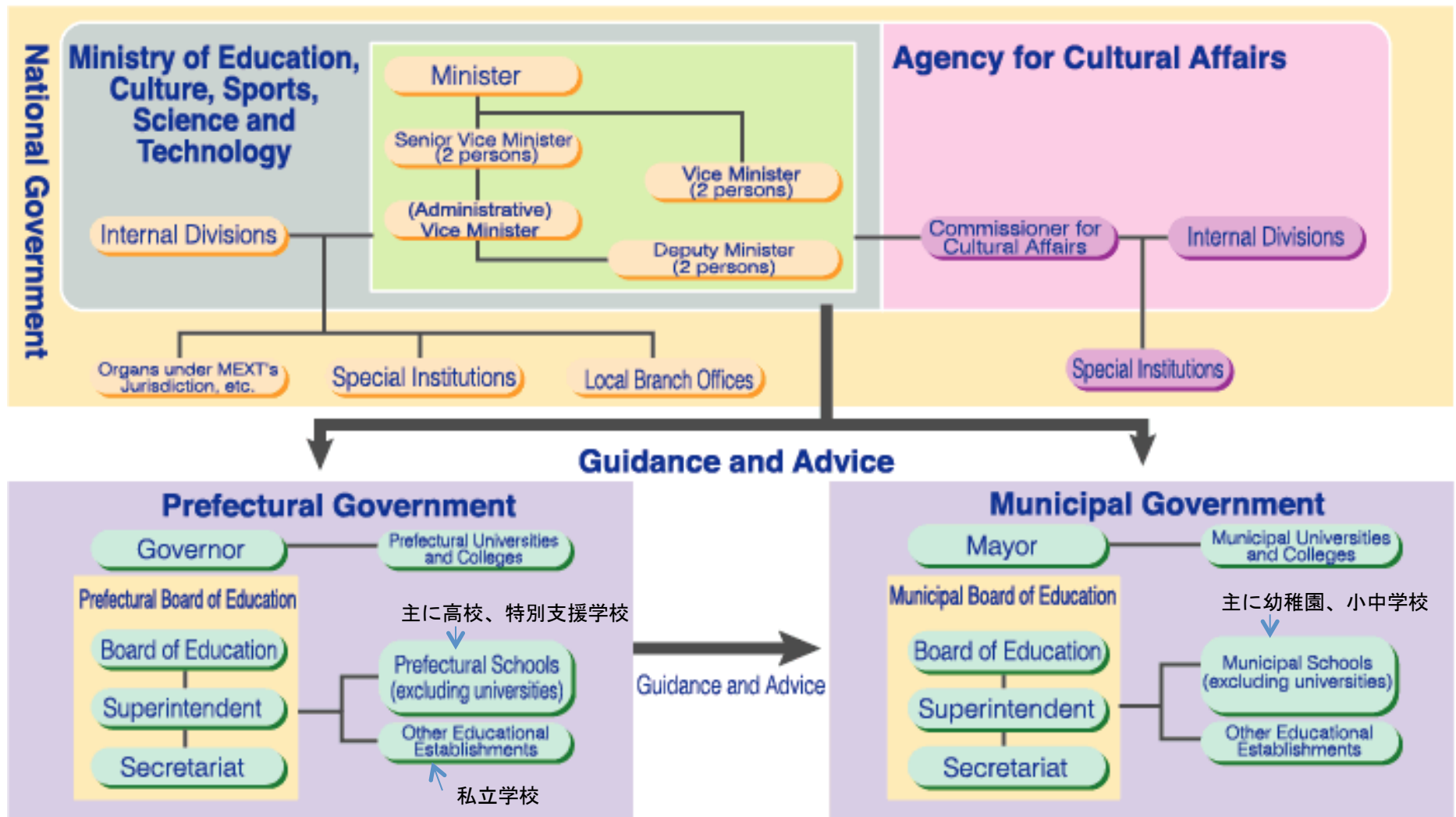
Ministry of Education, Culture, Sports, Science and Technology

文部科学省大臣官房文教施設企画部施設助成課

Japanese School systems

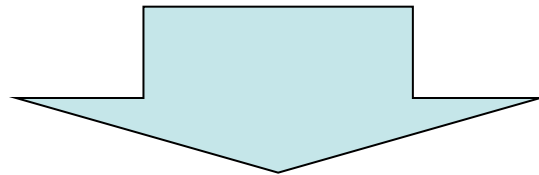


Relationship between Central Government and Prefectural/Municipal Governments



Functions of school facilities

- Places for children to learn and engage in daily activities
- Places for community residents' lifelong learning, sports and cultural activities
- Evacuation sites for local residents when natural disasters such as earthquakes strike



Vital to ensure safety of school facilities when earthquakes or other natural disasters strike

The Great Hanshin Earthquake

- 17 January 1995 05:46
- Magnitude 7.3
(*shindo*/seismic intensity: 7)
- Number of deaths
6,437 people
- Damage to school facilities
3,883 buildings



Severe damage to
columns and beams



Severe damage to
column

Damage to school buildings from Hanshin Earthquake

【Collapse of columns and beams】



【Collapse of column】



【Collapse of ceiling】



Efforts as a result of damage caused by Great Hanshin Earthquake

●Enactment of laws

- Act on Special Measures for Earthquake Disaster Countermeasures (June 1995)
 - Stipulates special financial measures by national government regarding earthquake disaster countermeasures for public facilities
- Act on Promotion of the Earthquake Retrofitting of Buildings (October 1995)
 - Stipulates items for seismic evaluation and earthquake retrofitting

●Subsidies for earthquake resistance projects to school facilities.

●Formulation of guidelines, manuals, and collections of examples pertaining to earthquake resistance projects for school facilities.

The Great East Japan Earthquake

- 11 March 2011 14:46
- Magnitude 9.0
(*shindo*/seismic intensity: 7)
- Number of deaths and missing:
21,839 people
- Damage to school facilities:
7,988 buildings



Tsunami engulfed up to the 3rd floor of the school building



The school gymnasium was utilized as an evacuation shelter

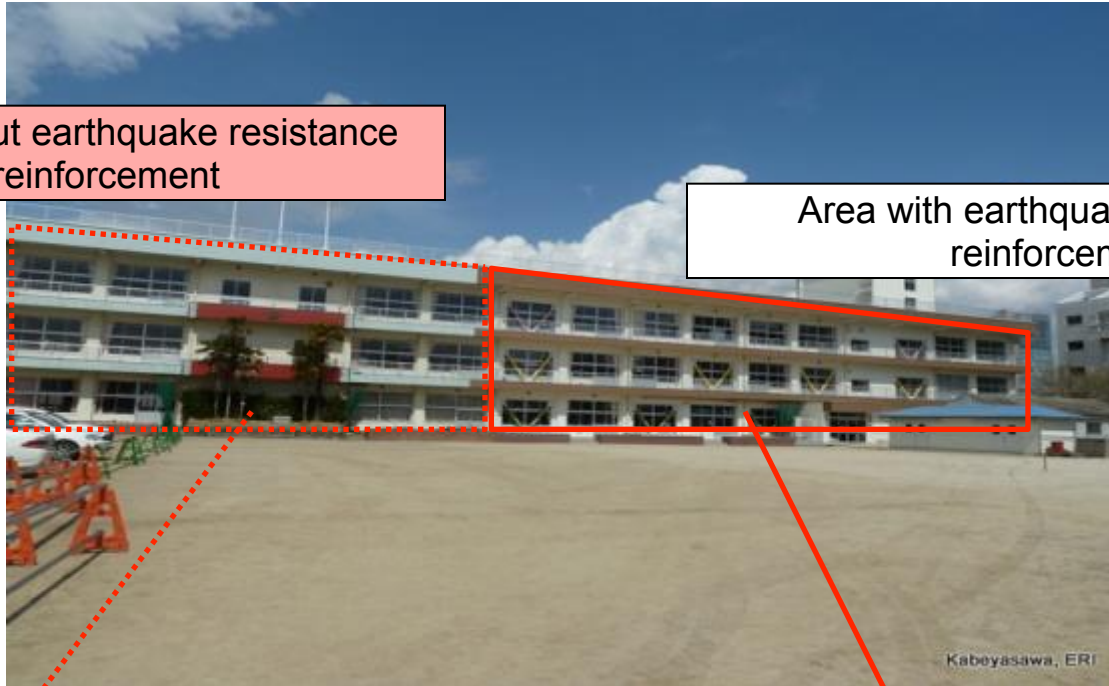


The gymnasium's ceiling completely collapsed

Effect of Earthquake Resistance Reinforcement

Area without earthquake resistance reinforcement

Area with earthquake resistance reinforcement



Collapse of column

No major damage



- **Further promotion of earthquake resistance projects for structures**

- **Promotion of earthquake resistance projects to non-structural features**

- Measures against risk of suspended ceilings at gymnasiums are a top priority

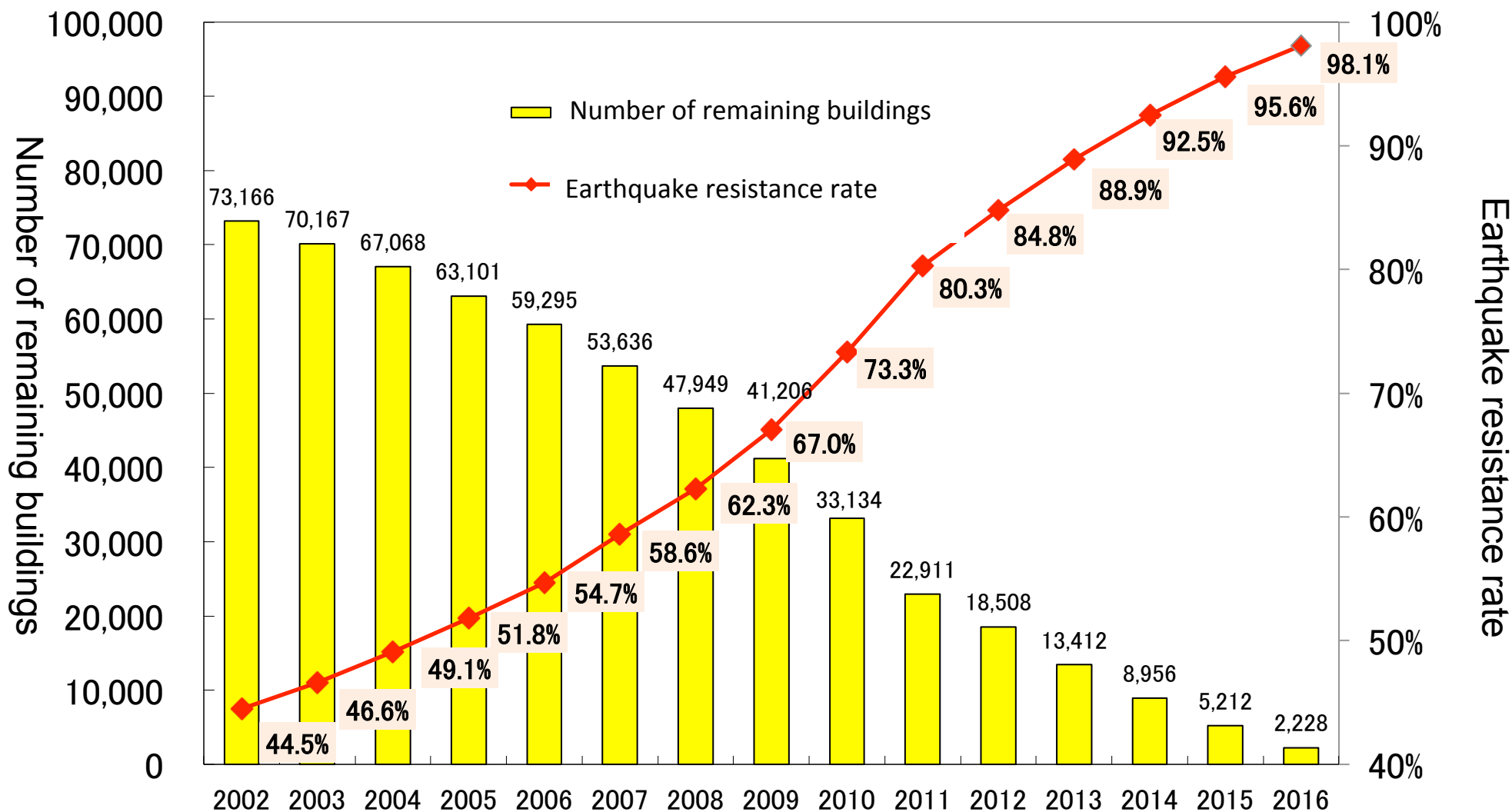
- **Measures against tsunamis**

- Development of escape routes to elevated areas, installation of escape stairs to rooftops, relocation to elevated areas

- **Strengthening of functioning as evacuation shelters**

Changes Resulting from Earthquake Resistance Projects for Public Schools

Improvements in earthquake resistance rates and numbers of remaining buildings without earthquake resistance (public elementary and secondary schools)



Further Promotion of Earthquake Resistance Projects for Structures

Basic Plan for the Promotion of Education

Approved by Cabinet decision on June 14, 2013

Second section:

Educational measures to be implemented over the next 5 years

Basic policy 19: Ensuring student safety at schools, such as by development of an educational research environment and/or enhancement of education for safety.

Earthquake resistance projects for public school facilities shall be promoted steadily, aiming for the completion of earthquake resistance projects as quickly as possible before the end of fiscal year 2015, based on the Basic Policy for Facility Development for Public Compulsory Education Schools.



Forecast of the earthquake resistance rate
by the end of fiscal 2016: 98%

Earthquake resistance of public elementary, junior high
school buildings almost totally completed.

Guidelines for Promoting Retrofitting of Buildings for Earthquake-proofing

Is Value (Seismic Index Values of structures)

- The value is an index to indicate earthquake-resistance performance of buildings. It is decided by the following factors:
① strength of building ② building shape ③ deterioration due to aging

Technical guidelines from the Act on Promotion of Retrofitting of Buildings

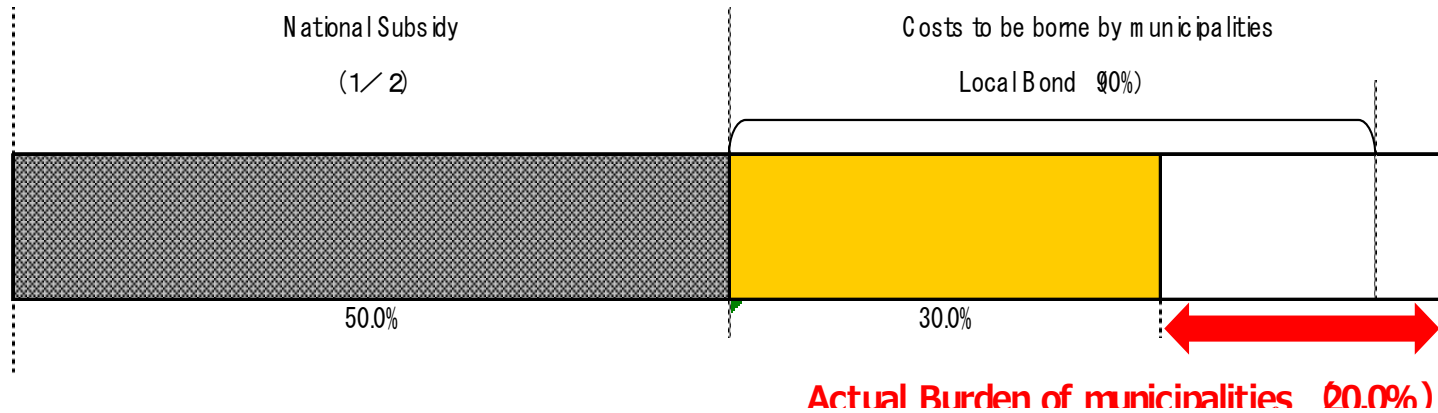
Value index < 0.3	High risk of collapse by earthquake
$0.3 \leq$ Value index < 0.6	Some risk of collapse by earthquake
$0.6 \leq$ Value index	Low risk of collapse by earthquake

- MEXT has set a goal for the seismic value for school facilities after an earthquake resistance project to exceed roughly 0.7, considering the safety of students at the time of an earthquake as well as the facilities' function as an evacuation site after the disaster.

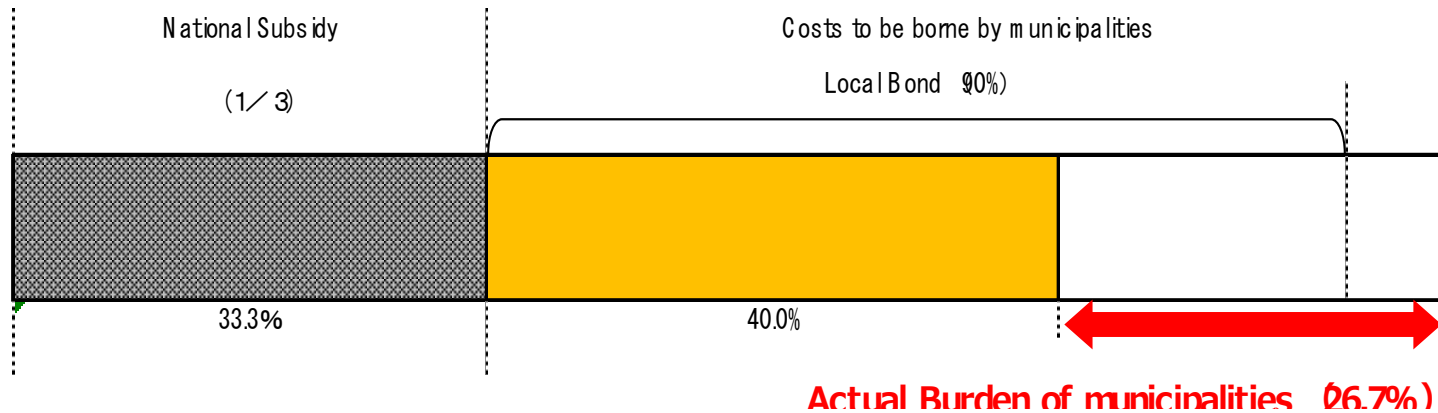
Financial sources for public school earthquake resistance projects

(1) Reconstruction

◆Reconstruction (≤ 0.3)

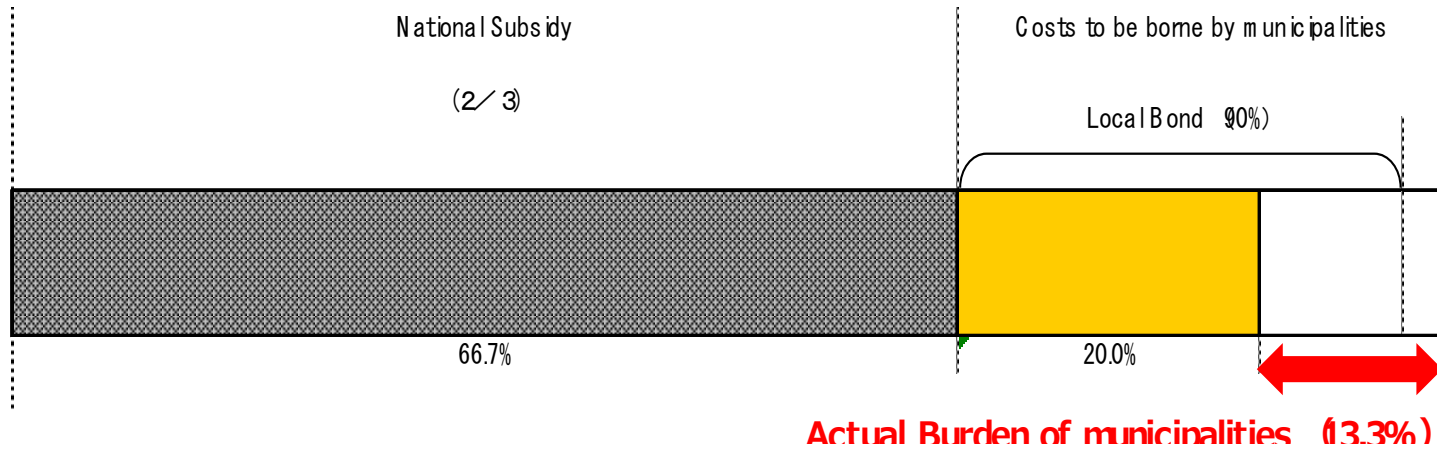


◆Reconstruction (≥ 0.3)

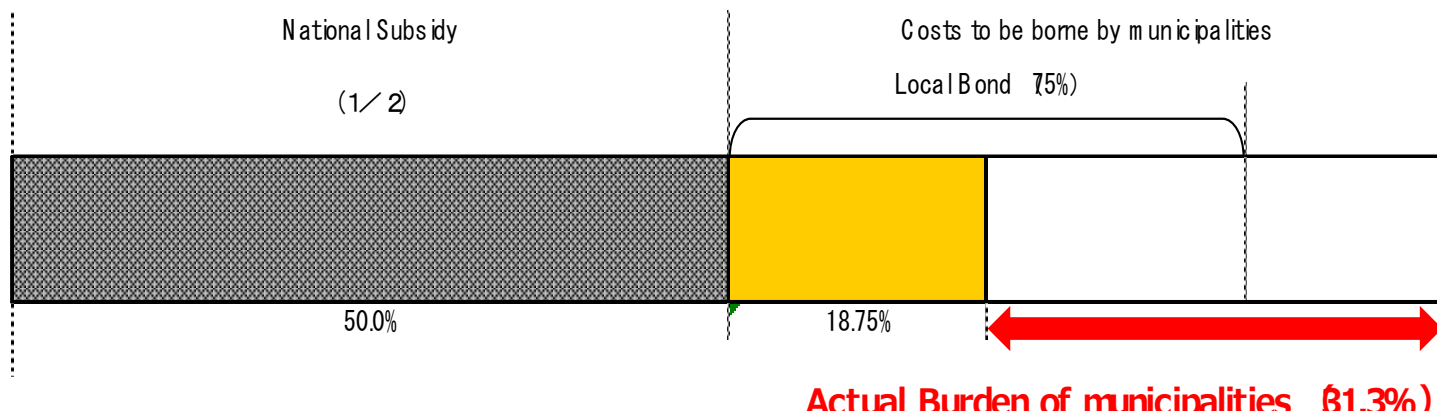


(2) Retrofitting

◆ Seismic retrofitting ($\beta < 0.3$)

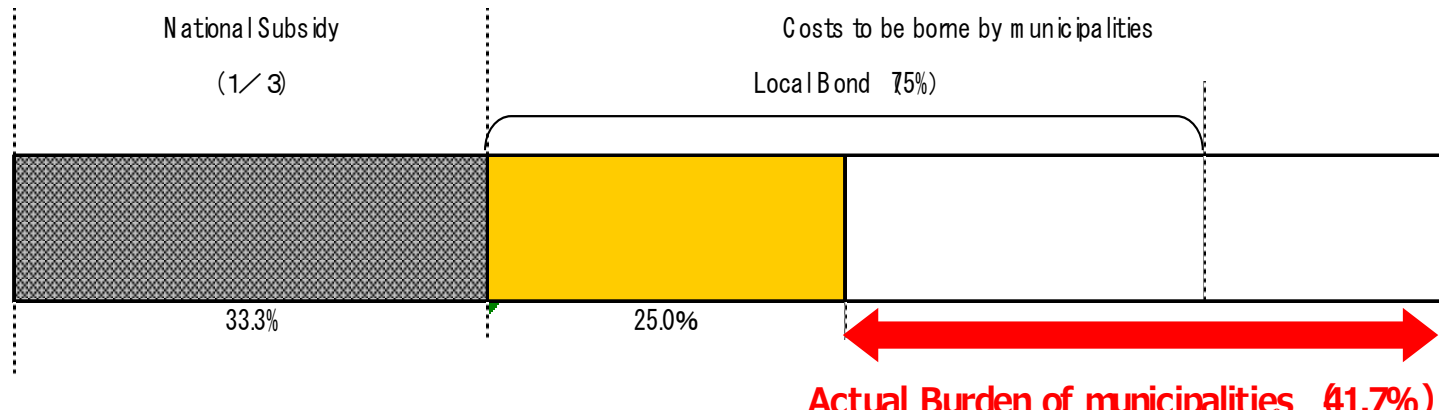


◆ Seismic retrofitting ($\beta \geq 0.3$)

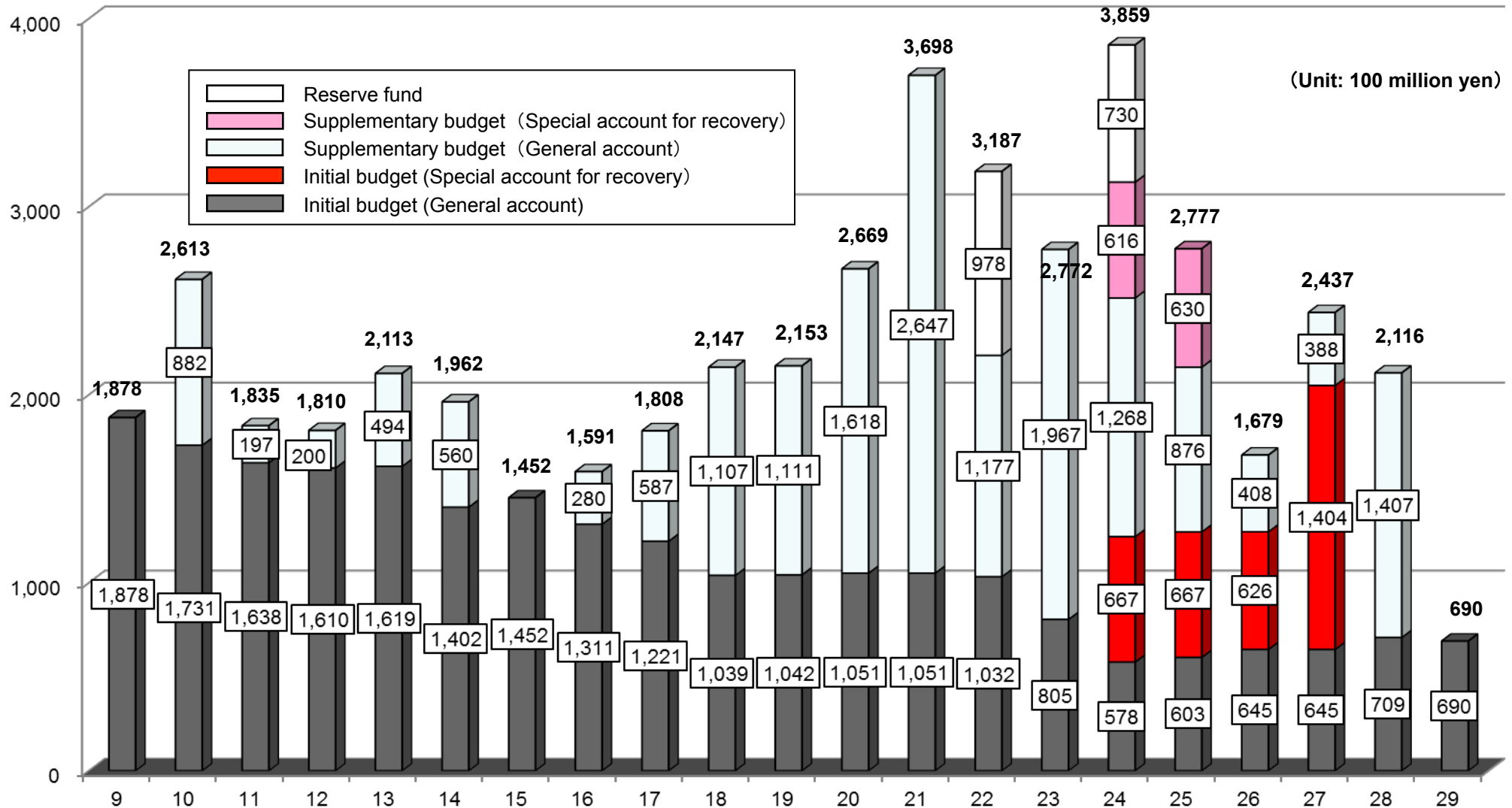


(3) Seismic retrofitting for non-structural elements

◆ Seismic retrofitting for non-structural elements



Trends in Budgeting for Public School Facilities



Notes: Supplementary budget amounts for FY2001, FY2008, FY2009, and FY2011 are the total of the first, second, and third supplementary budgets (regarding FY2009, includes amount suspended).

The reserve fund for FY2012 is total of reserve fund for emergency economic measures and regional revitalization (14.9 billion yen) and reserve fund for special account for reconstruction from Great East Japan Earthquake (58.1 billion yen).

Because of rounding off, totals will not always match exactly. Amounts for Okinawa Prefecture earmarked in Cabinet Office budget.