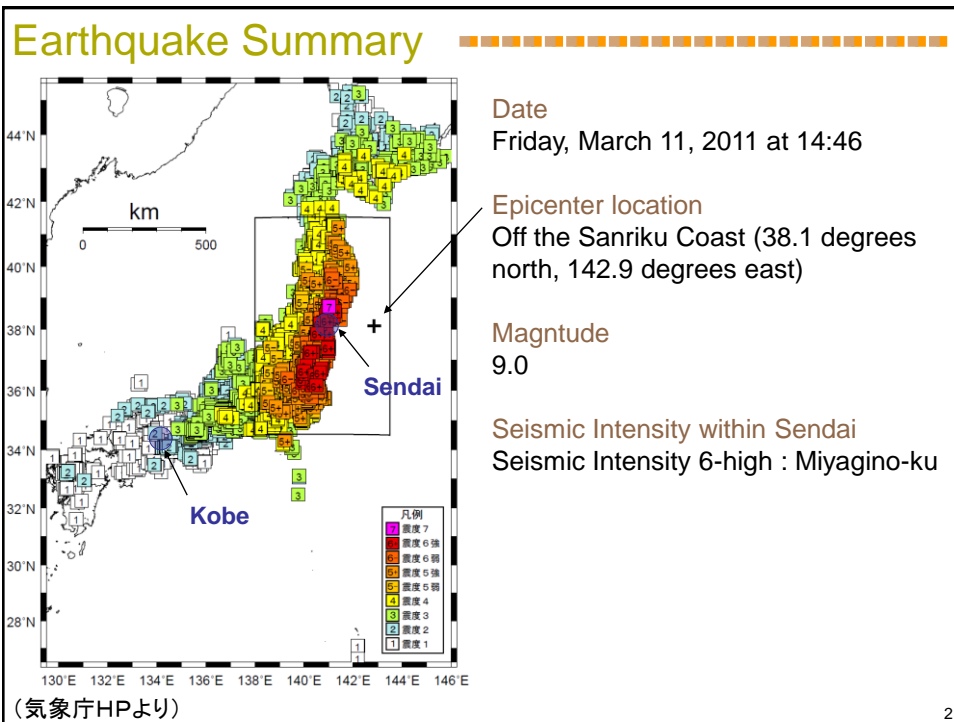
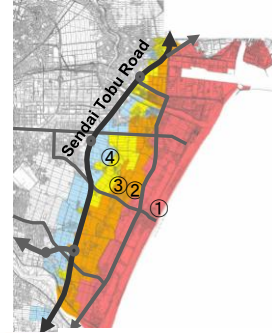




Sendai City Current State of Reconstruction
 Emiko Okuyama, Mayor, City of Sendai



Earthquake Summary



- ① Houses were washed away or water reached to the ceiling of the 1st floor
- ② Water reached up to 1m above the 1st floor
- ③ Water reached up to the 1st floor
- ④ Water reached under the 1st floor

Tsunami Warning

March 11, 14:49

- Issued for the Pacific Coast of Tohoku region

Height, Arriving time

Sendai Port 7.2m (estimated scale)

(The first tsunami wave arrived about 1 hour after the earthquake occurred.)

Areas Flooded by the Tsunami

Population : 21,966
 Households : 8,086
 Area(m²): 4,633
 Flooded Buildings: 12,277

3

Damage in Sendai



◆Death Toll / Missing / Injured (as of Nov. 30, 2013)

	In Sendai	
	Sendai Residents	
Death Toll	899	805
Missing	30	
Injured	2,271	

※Sendai residents who died in the disaster : 979
 (Sendai residents who died outside of Sendai :174)

◆Building Damage (as of Nov. 25, 2013)

	In Sendai
Completely collapsed	29,981
Severely damaged	26,928
Partially damaged	82,346
Minor damage	115,746



◆Overall damage in Sendai (as of Jan. 29, 2013)

Estimated amount of damage 1.37 trillion JPY

4

Damage caused by the Tsunami



Villages swept away by tsunami (Near Sannbonzuka, Wakabayashi district)

5

Damage caused by the Tsunami



(Arahama, Wakabayashi district before the disaster)

(Arahama, Wakabayashi district after the disaster)



Trees for disaster prevention were completely washed away by tsunami

6

Damage caused by the Tsunami



(Arahama, Wakabayashi district before the disaster)

(Arahama, Wakabayashi district after the disaster)



Town where only the foundation of houses remain.

7

Damage caused by the Tsunami



(Sewage plant struck by tsunami (Minami-Gamo Filtration Plant))



(House hit Nakano Elementary School)



(Search for missing persons)



(Cars washed away by tsunami)

8

Damage of residential districts in hilly areas



(Otoy, Taihaku-ku)



(Matsumorijingahara, Izumi-ku)



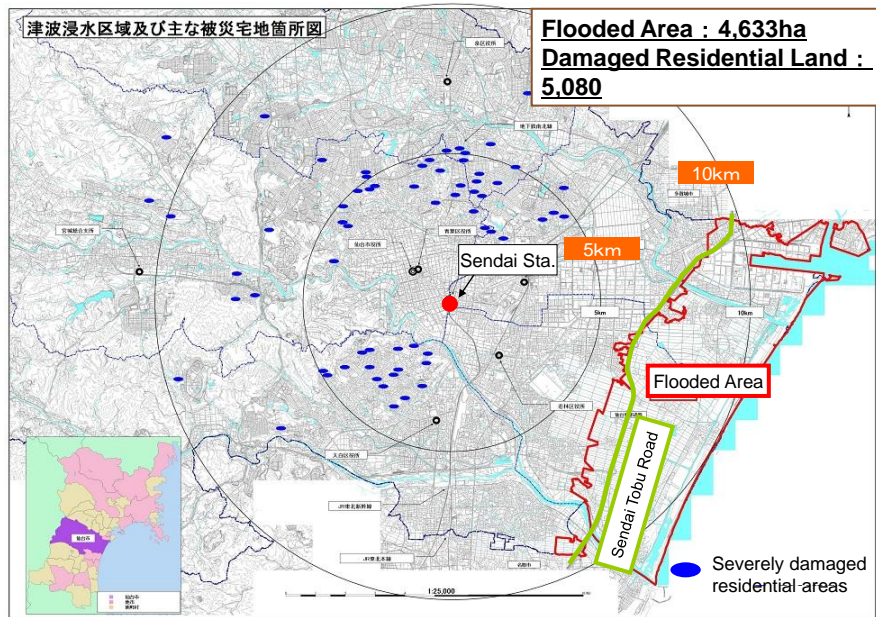
(Oritate, Aoba-ku)



(Midorigaoka, Taihaku-ku)

9

Areas Flooded by the Tsunami and Residential Area Damaged by Earthquake



10

Problems resulting from the decline of city functions



Damaged infrastructure
(electricity, water, gas, etc.)



Fuel shortage
(gasoline, kerosene, heavy oil, etc.)



Increase of evacuees due to those who had difficulty returning home



Food shortage due to the damage to stores and distribution systems

Source: Kahoku Shinpo Newspaper, Sankei Newspaper, Jiji Tsushin newspaper 11

Resident Efforts (Examples of Community Projects)

Tsunami-ravaged Arahama in Wakabayashi

Evacuated for 2010 Chili earthquake

- ↓ (Experienced directly the difficulty of elderly people to evacuate inland)
- ◆ Rerouted evacuation from inland to Arahama Elementary School
- ◆ Increased emergency supplies 1.5x
(Enough for 800 persons to survive for 3 days)
- ◆ Moved blankets and other supplies from gym to 3rd floor



Reduced impact in 2011 Great East Japan Earthquake

Neighborhood association in Fukuzumi-cho, Miyagino

Agreement on bilateral cooperation with districts and organizations inside and outside the prefecture (As preparation for earthquakes off the coast of Miyagi Prefecture)

Fukuzumi cho → Other districts/organizations

- Aid to areas stricken by Chuetsu earthquakes in Niigata Pref. and inland earthquakes in Iwate/Miyagi Pref.
- Snow removal in Tsuruko, Obanzawa City, etc.



Other districts/organizations → Fukuzumi-cho

- Providing supplies and donations for Great East Japan Earthquake

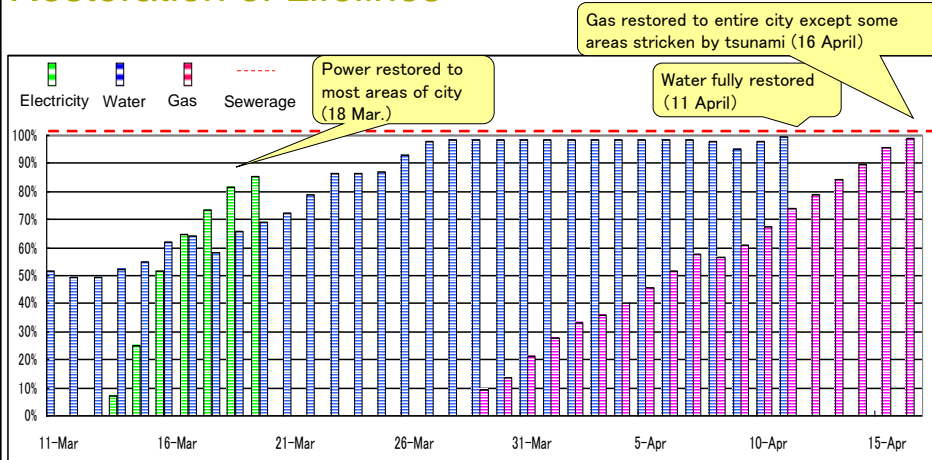
12

Support from inside and outside the city



13

Restoration of Lifelines



※Power restoration is given for all Miyagi Prefecture.

【Full restoration of lifelines】

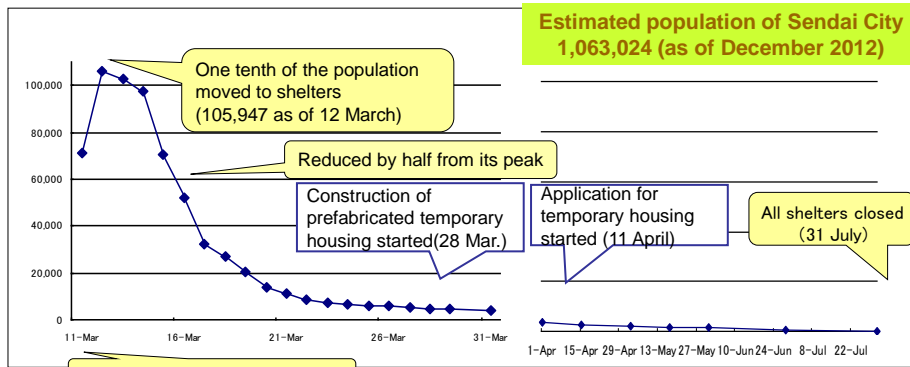
- Electricity: 3/18
- Water: 4/11
- Gas: 4/16
- ※Excluding areas damaged by tsunami

【Restoration of public transportation】

- City buses: Service started on about 70% of lines across city on 3/12. Normal service resumed on 4/18.
- Subways: Service started along some sections on 3/14. Normal service resumed on all lines on 4/29.
- Sendai Airport: Temporary service started for emergency flights on 4/13. Normal service resumed for domestic flights on 7/25.

14

Transition of the number of the evacuees



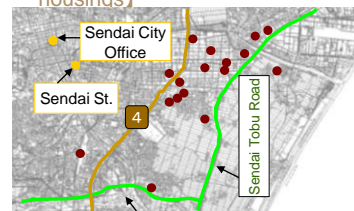
15

Construction of Temporary Housing

【Number of households】

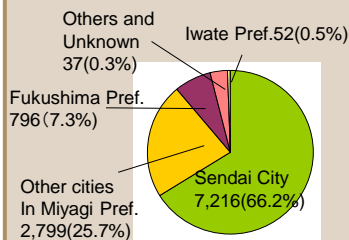
	30 Mar.	1 Dec.	Ratio
Prefabricated temporary housing	1,346	1,236	11.3%
Private rental housing	9,838	8,890	81.6%
Public rental housing, etc.	825	774	7.1%
Total	2,009	10,900	100.0%

【Location of prefabricated temporary housings】



Place of residence before the disaster (as of 1 Dec.2012)

Total (N=10,900)



1/3 is from outside Sendai City (Nearly 10% from Fukushima Pref.)



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Life support in temporary housing

[Improvement of housing environments]



Slope installation

Meeting place of temporary housing "Home for Everybody"
(Won the gold prize of the Good Design Award 2012)



Heat insulator installation



Comprehensive learning class of an elementary school (inside "Home for Everybody")

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Live support in temporary housing

Continued support to temporary housing residents by the local government, related organizations, support groups, etc.

Life Support

Health support and observation through individual visits, gathering the community through social events, employment support and provision of support information



Life support system for aged single persons, etc.

Support system for The victims

Recovery periodicals

18

Debris Removal

Estimated debris generated in Sendai City

About **1.35 million ton**



December 2011 Demolition completed
 July 2012 100,000 ton of combustible material received from Ishinomaki site

As of 11/30/2012 21,000 ton received

March 2014 Planned completion of treatment
 (Including restoration of dump site to original state)

As of 11/30/2012 49% treated

50% or more of debris targeted for recycling

As of 11/30/2012 65% recycled



Sendai approach (Self-containment)

Source

Roughly classified into
 Combustible
 Non-combustible
 Recyclable

Dump site

Secured 3 dump sites (100 ha total) and treatment facilities in eastern coastal area
 Subdivided into 10-plus categories of article, i.e., concrete, home appliances, wood, etc.



(Temporary incinerator)



(Stacked damaged vehicles)



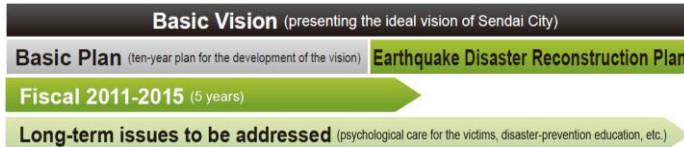
(Mountains of home appliances)



(Mound of metal)

Sendai City Earthquake Disaster Reconstruction Plan

◆ Period of the plan

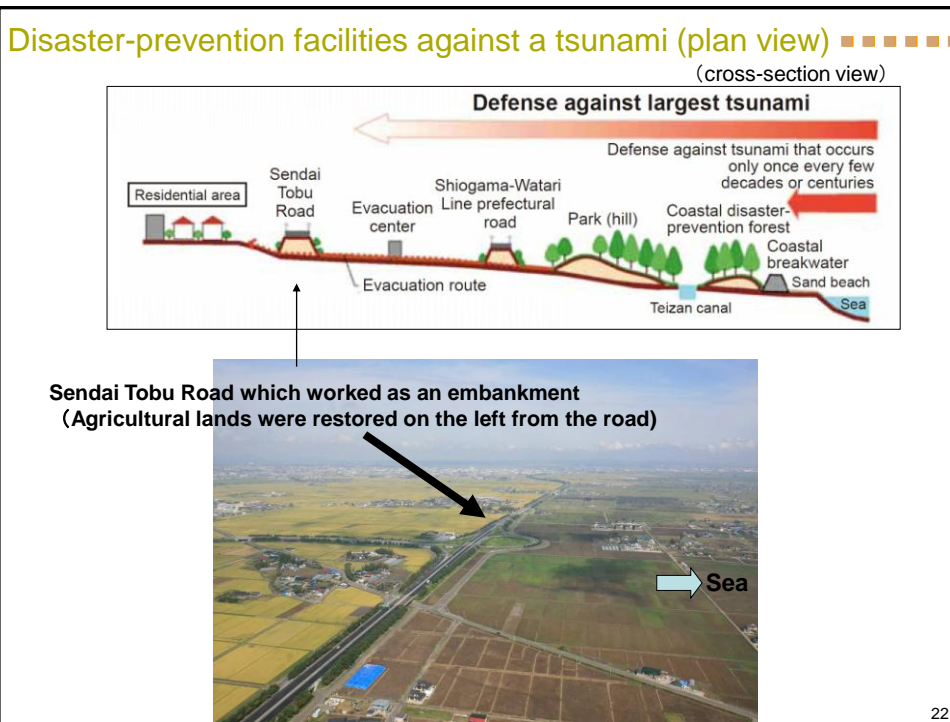
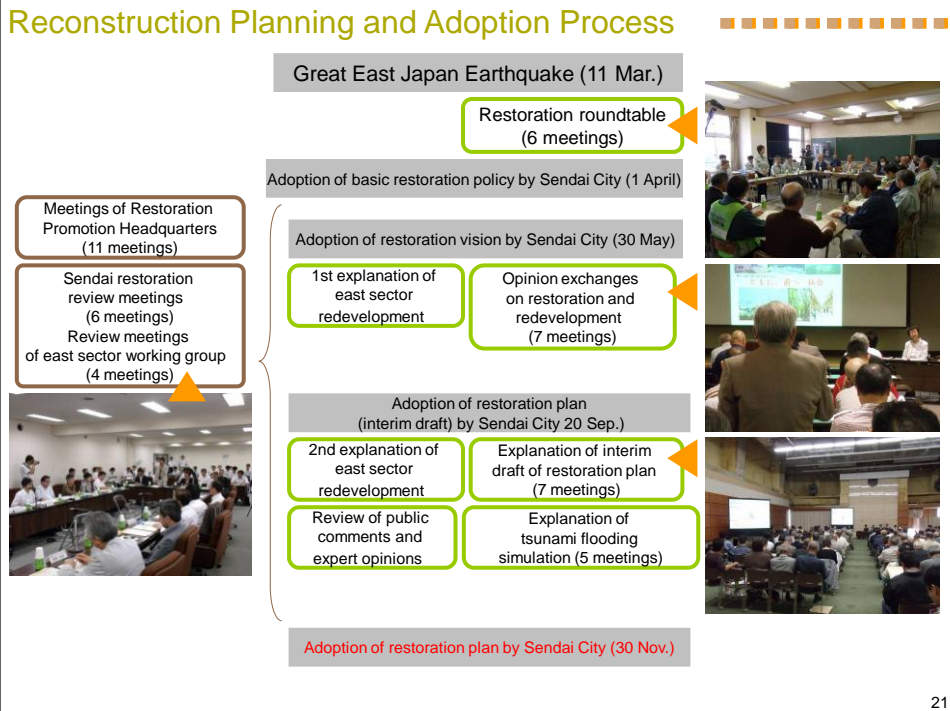


◆ For Reconstruction



◆ Reconstruction projects for the one million citizens of Sendai

- 1 Tsunami reduction and housing reconstruction project to "protect lives from a tsunami"
- 2 Residential area rebuilding project to "build the foundation for safe homes"
- 3 Life recovery project to "support individual livelihoods"
- 4 Agricultural and food frontier project to "strongly revitalize agriculture"
- 5 Seaside exchange and revitalization project to "restore the beautiful coast"
- 6 Model development project for a disaster-proof Sendai to "learn from the past disasters for the future"
- 7 Energy-saving and new energy projects for a "sustainable energy supply"
- 8 Sendai economy development project to "improve urban vitality and the quality of life"
- 9 Exchange promotion project to "promote the features of the city and its reconstruction efforts"
- 10 Earthquake disaster memorial project to "convey the memory of the earthquake disaster to future generations"



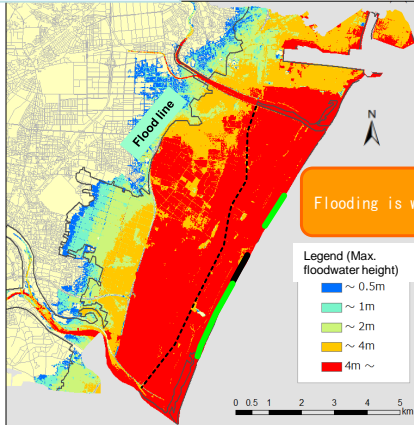
Tsunami Simulations

① As a basis for future predictions

Reoccurring at spring high tide
 If the same 3/11 tsunami occurred at spring high tide (T.P.+0.76 m), water would be about 1.2 m higher than tides on 3/11.

Tide level: T.P.+0.76 m
 Coastal levee T.P.+5.5 m
 Coastal levee T.P.+6.2 m

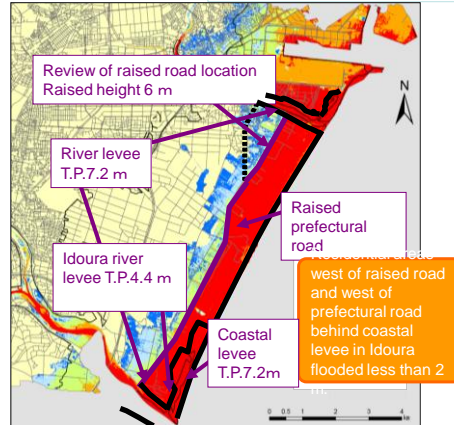
Levee heights and locations from 3/11/2011



② Based on restoration plans

1. Coastal and river levees as planned by Japan and prefecture.
2. Raised roadbeds laid over original location of prefectural roads, but changes were made in Okada and Minami Gamo to downsize disaster risk zone.

Tide level: T.P.+0.76 m
 Coastal/River levees T.P.+7.2 m
 Raised prefectural roads 6 m



• Elevation data: Immediately after earthquake struck on 3/11/2012 (in consideration of land subsidence)
 • Applied tsunami scale: Modeled and simulated on 3/11/2012 tsunami (historical largest class) by Tohoku University.

Building of Tsunami Evacuation Infrastructure

Basic thoughts on evacuation infrastructure and routes is under study.

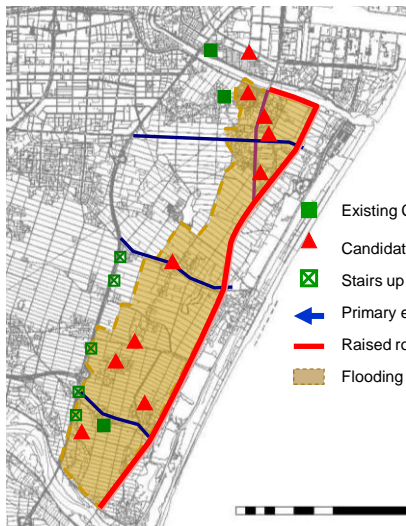
Thoughts on locations of evacuation infrastructure [Provisory]

- ◆ Use existing city infrastructure as evacuation infrastructure.
- ◆ Build evacuation infrastructure on city land. Prioritize over other infrastructure.
- ◆ Raise prefectural roads based on 3/11/2011 damage. Build evacuation infrastructure in areas still predicted to flood. Prioritize over other infrastructure.

Safe house built by private sector in cooperation with Sendai City



Photo courtesy of Yomiuri Newspaper

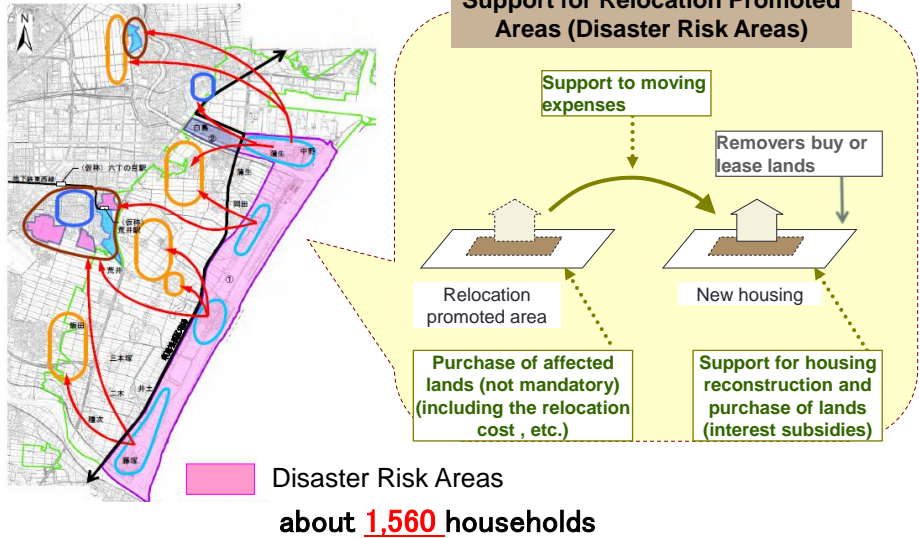


Thoughts on evacuation routes [Provisory]

- ◆ Ensure road width to enable smooth evacuation even with stopped cars along shoulder, etc.
- ◆ Build intersections to enable smooth merging.
- ◆ Build earthquake-resistant roads, etc.

Disaster prevention collective relocation

(Image of group relocation)



25

Conceptual View and Schedule for New Housing for Relocated Neighborhoods

Example 1 of new housing

New housing (Planned)

Planned area of land usage
(※Future land usage plans may change locations of new housing.)

Conceptual view

Example site for new housing

2012	2013	2104	2015
Acquire and prepare land for new housing. Release land for home construction as soon as it is prepared			
Developed area of Arai public zone Area behind Sendai Port Gamozatsukofukuro	Tagonishi Araihigashi	Ishiba	Araiminami, Arainishi Area adjacent to Tagonishi, Minamifukumuro, Kamiokada, Shichigo, Rokugo

26

Rebuilding and Aiding Damaged Residential Areas

Because of the amount of damaged incurred,

5,080 homes in Sendai City were assessed as “dangerous” or “caution required.”

(As of 5/31/2012)

Rebuilding as public project managed by Sendai City (About **50%**)

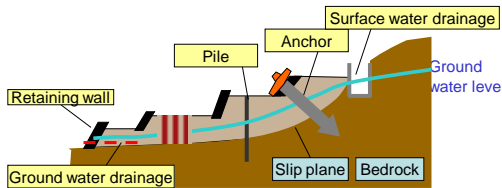
Rebuilding by owner under Sendai City assistance program (About **50%**)

(As of 12/17/2012)

Construction is paid for with national rebuilding grants, etc. Owners pay partially to maintain private property.

90% of expenses above 1 million JPY provided in assistance to owners who rebuild retaining walls, etc., when certain conditions are met.

(Conceptual view of slope collapse and landslide prevention work)



Oritachi, Aoba-ku

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Building Public Housing as a Part Reconstruction



Conceptual view of public housing in Tagonishi



Conceptual view of public housing in Arai Higashi

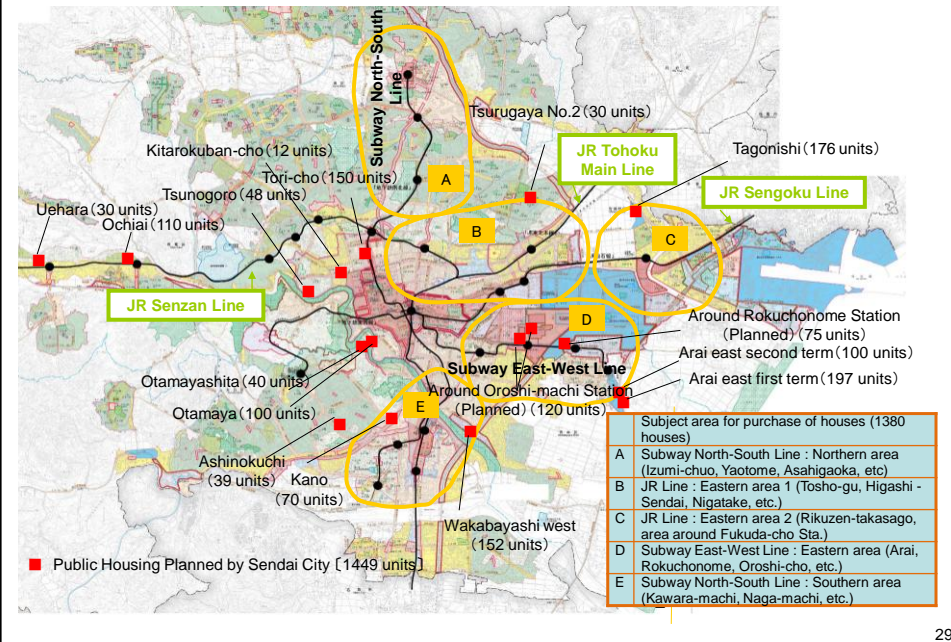
Targeted number of units 3,000

Areas built directly by Sendai City	1,449
Areas built by public offering/purchase	1,380
Areas built to relocate neighborhoods, etc.	171

Households that lived in flooded areas and households with handicapped or elderly persons are being recruited with the intention of forming future communities.

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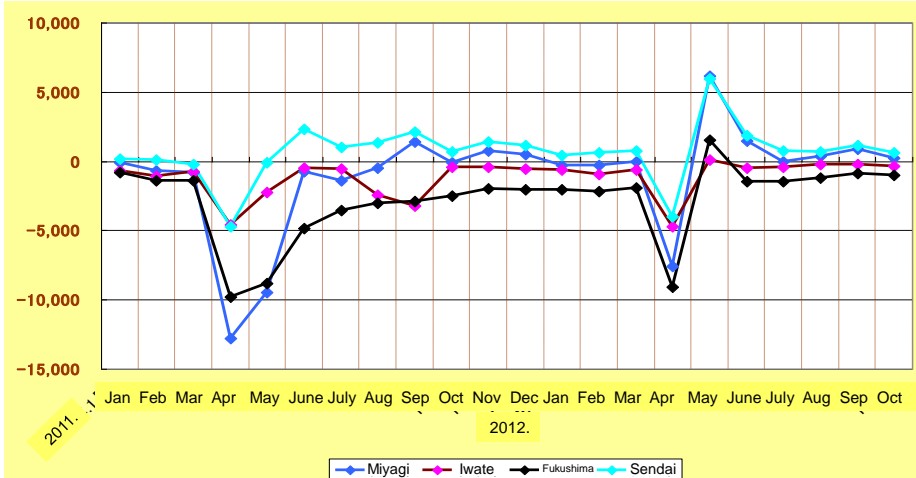
Construction of Public Housing



29

Population Shift before and after the Disaster

(Increase and decrease from the pervious month)



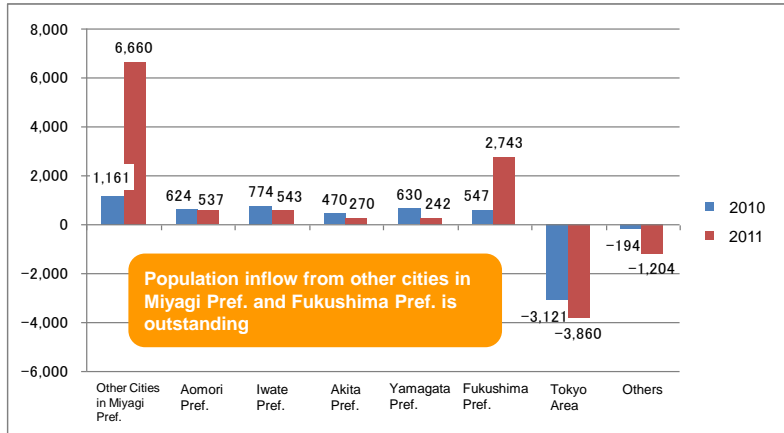
	H23.1月	2月	3月	4月	5月	6月	7月	8月	9月	10月	11月	12月	H24.1月	2月	3月	4月	5月	6月	7月	8月	9月	10月
Miyagi	-103	-706	-828	-12,791	-9,479	-770	-1,415	-493	1,407	-88	766	502	-281	-282	-55	-7,591	6,176	1,485	2	366	881	214
Iwate	-671	-1,047	-716	-4,607	-2,212	-483	-523	-2,437	-3,219	-406	-419	-577	-587	-920	-639	-4,725	111	-462	-414	-220	-230	-323
Fuku shima	-835	-1,365	-1,372	-9,798	-8,803	-4,847	-3,553	-2,994	-2,900	-2,511	-1,955	-2,016	-2,033	-2,177	-1,890	-9,072	-1,568	-1,458	-1,450	-1,166	-869	-1,008
Sendai	141	79	-249	-4,684	-79	2,344	1,029	1,337	2,108	701	1,429	1,117	437	610	731	-3,993	5,946	1,889	753	717	1,134	614

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Population Shift before and after the Disaster

(Population Shift between Sendai and other areas)

※Calculation method: (Move to Sendai) - (Move from Sendai)



Source: "Population Trend of Sendai City in 2011" (Published in March 2012)

31

In Preparation for an Increase in Visitors

▼Crowd-drawing events

- 4 ~ 6/2012 Sendai-Miyagi 【Travel to *Date*】 spring campaign
- 4 ~ 6/2013 Sendai-Miyagi destination campaign
- 5/2013 Sendai International Half-Marathon



▼Large-scale events in Sendai City in 2012

- 12th WTTC (World Tourism and Travel Council) Global Summit (April)
- High-level international conference on large-scale natural disasters (July)
- Nenrin Pic Miyagi-Sendai 2012 (October)
- Japan Women's Conference in Sendai 2012 (October)
- Sendai Dialogue on Disaster Risk Reduction concurrent to Annual Meeting of the IMF and World Bank (October)



12th WTTC
Global Summit

▼Attracting international conventions

Attracting the "2015 World Conference on Disaster Reduction"

32

Sendai's Future Role as an International Center for Disaster Risk Reduction

Recognized as a "Role Model City for Disaster Management" by the UN

Sendai City was the 2nd city in Japan (after Hyogo Prefecture) and 35th worldwide to be recognized as a Role Model City for Disaster Management under the UN's "Making Cities Resilient" World Disaster Reduction Campaign."

Reason for recognition

Programs that involve resident participation and "resident efforts" with regard to pre-event disaster mitigation programs and redevelopment of a disaster-resilient, environment-friendly city of a new dimension from the lessons learned from the earthquake **were highly rated in particular.**

Role model theme

A role model for promoting community based DRR and empowering the people to act on DRR



Sendai Mayor Emiko Okuyama receiving the certificate of registration from UN Secretary-General's Special Representative for Disaster Risk Reduction, Margareta Wahlström (10/09/2012)

Moving forward as a role model city for disaster management



Tell the world about the lessons of the Great East Japan Earthquake and the city's disaster reduction and reconstruction efforts, and work with the UN to help develop a culture of disaster risk reduction around the world.

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Sendai's Future Role as an International Center for Disaster Risk Reduction

Sendai is working to attract the 3rd World Conference on Disaster Reduction to Sendai/Tohoku so as to tell the world about the reconstruction going on in Tohoku and the experiences and lessons learned from the Great East Japan Earthquake. Sendai wants to contribute to the development of a disaster risk reduction culture around the world and the crafting of the UN's strategy on disaster reduction.

Telling the world about the lessons learned from the Great East Japan Earthquake

Tell the world about the lessons learned in Sendai and Tohoku as a role model city at international conferences.

- World Ministerial Meeting on Disaster Reduction in Tohoku (Sendai City)
- Special events planned for the Annual Meeting of the IMF and World Bank
- Sendai Dialogue on Disaster Risk Management (Sendai City)
- 5th Asia Ministerial Conference on Disaster Risk Reduction (Indonesia)

Participating in crafting a new disaster reduction strategy post the Hyogo Framework for Action

The UN's Hyogo Framework for Action disaster reduction strategy greatly contributed to the development of a culture of disaster reduction around the world over these past 10 years. Given the new circumstances, Sendai wants to participate in discussions on a "Post-Hyogo Framework of Action" through the UN and elsewhere.

- Perspectives of development and disaster reduction (Importance of investing in disaster prevention)
- Limits to public aid and the importance of helping oneself and others
- Importance of collaborating with and participating in various sectors toward building disaster prevention strength on the local level, etc.



Message from Sendai Mayor Emiko Okuyama at "Sendai Dialogue on Disaster Risk Management," a special event held concurrent with the Annual Meeting of the IMF and World Bank



Presentation by Sendai Vice Mayor Yukimoto Ito at the 5th Asia Ministerial Conference on Disaster Risk Reduction

In hosting the 3rd World Conference on Disaster Reduction in Sendai/Tohoku in 2015, Sendai wants to take disaster reduction onto a new stage with a "Sendai Framework of Action" that can effectively take the place of the "Hyogo Framework for Action."

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