

The First Asia-Pacific System Dynamics Conf.

**Activation of areas along railroad tracks  
(establishment of secure and safe life support network)**

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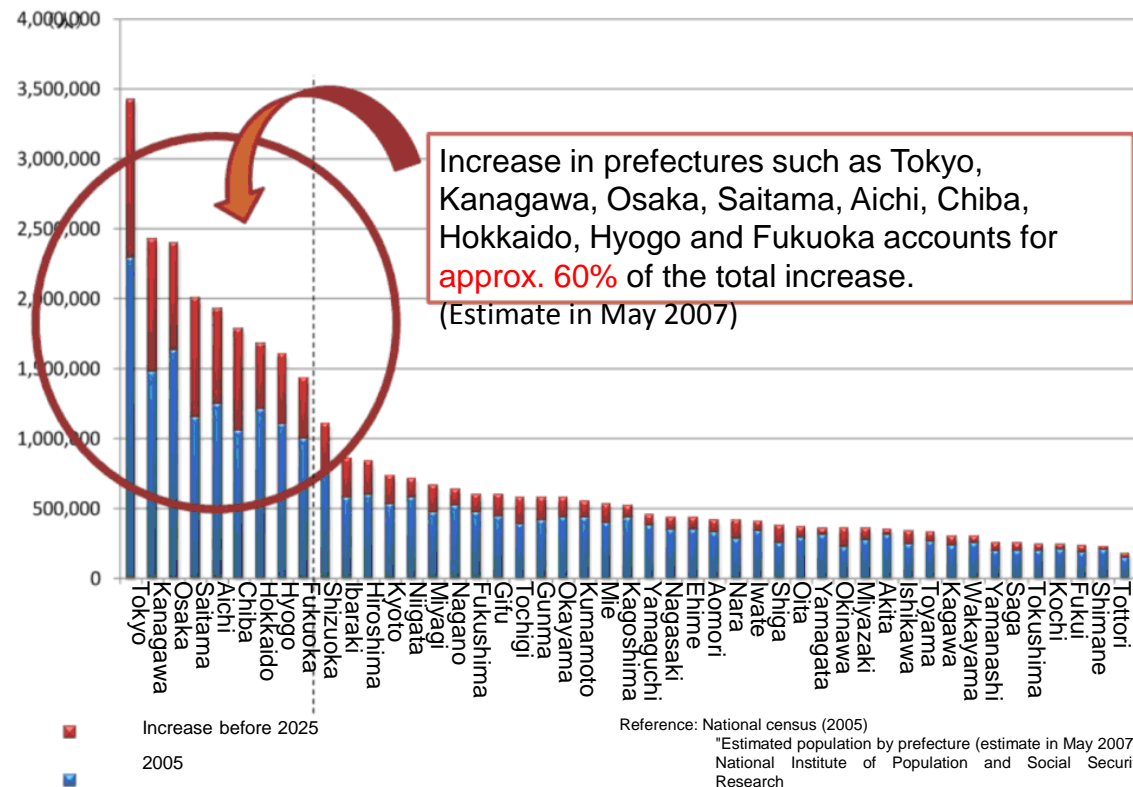
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# Background

- The acceleration of demographic aging in Japan, only elderly population, is anticipated to reach a peak in 2025 despite a decline in total population. It is expected that **large cities** will account for 60% of **the total increase in the elderly population by prefecture** between 2005 and 2025.

Increase in elderly population (65 or older) by prefecture (2005 --> 2025)



- It is likely that in the near future there will be a shortage of hospital beds and facilities if we just maintain existing medical treatment and nursing care. In fact health-care providers working on site have realized that physical, economics, and human resources are limited as it now stands in the health-care industry.
- In the final report prepared by the National Council on Social Security System Reform (hereinafter, the national council) held in August 2013, ‘social security to support safety and security of the public’ was advocated.
- It emphasized the necessity of the cooperation in the local community; that is, it is necessary for each resident in the community to participate in the social system where they mutually help and support each other.
- It means that the future objective is to provide health-care and welfare services at home to the extent possible in local communities familiar to the elderly with the mutual help among residents.
- It is to build the **regional comprehensive care system** consisting of health and welfare, health protection, and life support using mainly the health-care network.

## Increase of the elderly in the large cities

- Increase in the elderly and people requiring nursing care
  - ⇒ A shortage of hospital beds and insufficiency of services of nursing care facilities
  - ⇒ Living in areas familiar to the elderly
  - ⇒ The health-care cooperative network
  - ⇒ Participating in the social system where they mutually help and support each other: **Cooperation**
  - ⇒ Developing and activating volunteer services

Participation of various businesses for the regional comprehensive care system is required

⇒ Participation of railroad companies is also required.

# Challenges

- The future super-aging society, especially in the cities, will require the health-care service and life-support network. Engaged persons experience the limitation of linkage only among health-care related businesses for the development of such network. Especially in urban areas, participation of the railroad companies, a public transportation system possessing great tangible and intangible assets, will be required and tends to be linked with community or city development. The railroad companies should make effort to establish a new form of life-support network completely different with their past approaches. Also, we expect that partnership and information cooperation among different businesses using IT technology enables the development of secure and safe communities, leading to security of residents living in areas along railroad tracks and activation of such areas.
- This study used the system dynamics (SD) model to consider and discuss the effects of health-care and railway business cooperation on the activation of the areas along railroad tracks.

A railroad company has, under a philosophy of comfortable living environment creation, proceeded the real estate business like building condominiums.

However,

⇒ The total population decline led to lower transportation revenue.

But the elderly population living in the urban areas is growing.

⇒ The 60s or older move to **safe and secure cities**.

The secure and safe mean good and sufficient health-care and education environments.

The railroad companies should make the most of IT including their tangible and intangible assets as an infrastructure.

# Past nursing care businesses conducted by railroad companies

- K company    Assisted living pay nursing home    First in Kansai
- N company    Pay nursing home
- H company    Day service business    Rehabilitation
- JR company    Day service business    Training equipment  
Travel plans for facility users
- K company    Dementia network
- K company    Life support pay nursing home
- E company    Pay nursing home

- T railroad company concluded a business agreement with Y city in 2012

"Creation of next generation suburban towns"

The regional comprehensive care system by healthcare cooperation

Continuation/ regeneration of existing towns

Coordination of community residents, administrations, universities, and private sector → cooperation

Participation and problem-solving town creation

- Protect their own health

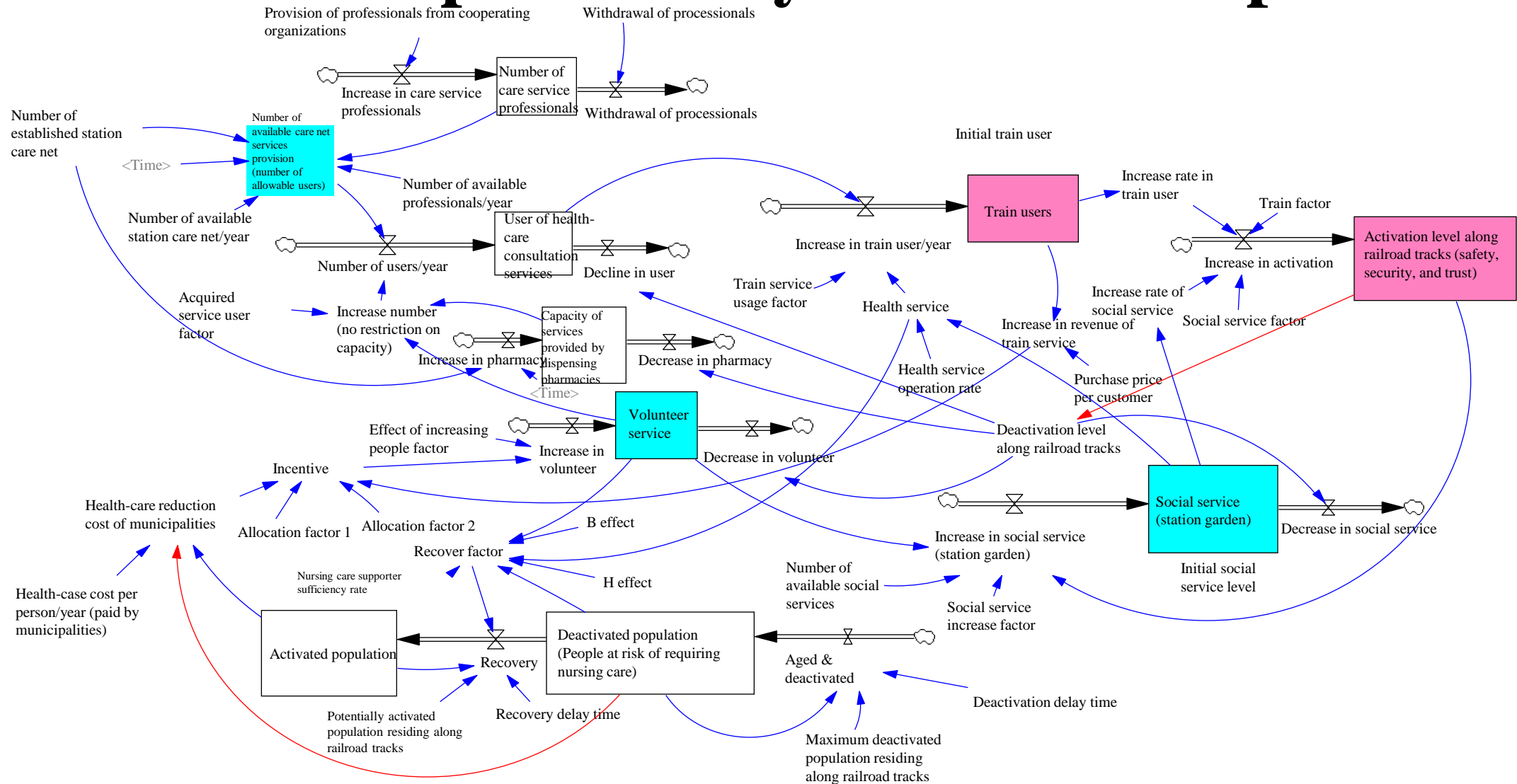
⇒ regional power

⇒ 'regional care plaza'

The business attempts to allow **the concepts of urban planning and improvement in care services to coexist**, aiming at **creating senior-friendly communities**.



# SD model: Business model of health-care and residents cooperation by railroad companies

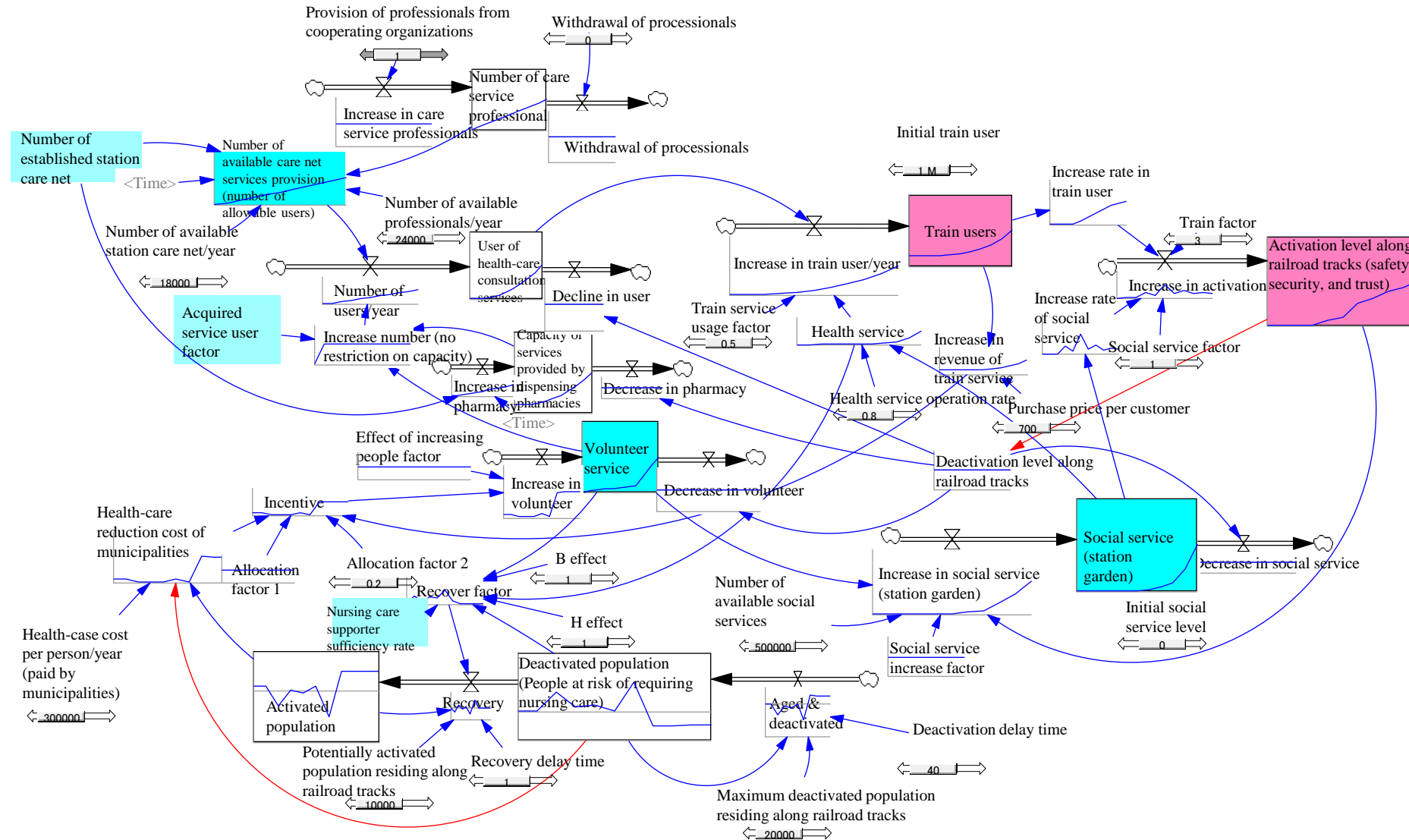


# Cooperation models among medical treatment, nursing care and residents along railroad

- The elderly include those requiring medical treatment/ nursing care, and healthy older people.
- Measures are required to decrease people requiring nursing care and increase independent elderly people.
- Care net services: ‘health-care support’ provided by qualified professionals such as physicians, nurses, pharmacists, care managers, certified care workers, physical therapists (PT), and occupational therapists (OT).
- Volunteer services: nursing care support (mainly life support) provided by non-professionals.
- Social services (healing services): health promotion through care prevention.
- ⇒ Railroad companies can increase the value of areas along railroad tracks by participating in the above services: the effective use of real estates which are the tangible assets like stations (including kiosk), shopping malls, and station squares possessed by railroad companies; the use of their intangible assets like point systems; or the creation of communities with senior-friendly train services.
  - ⇒Development of a profitable business model

# Simulation of cooperation model among medical treatment, nursing care and residents along railroad

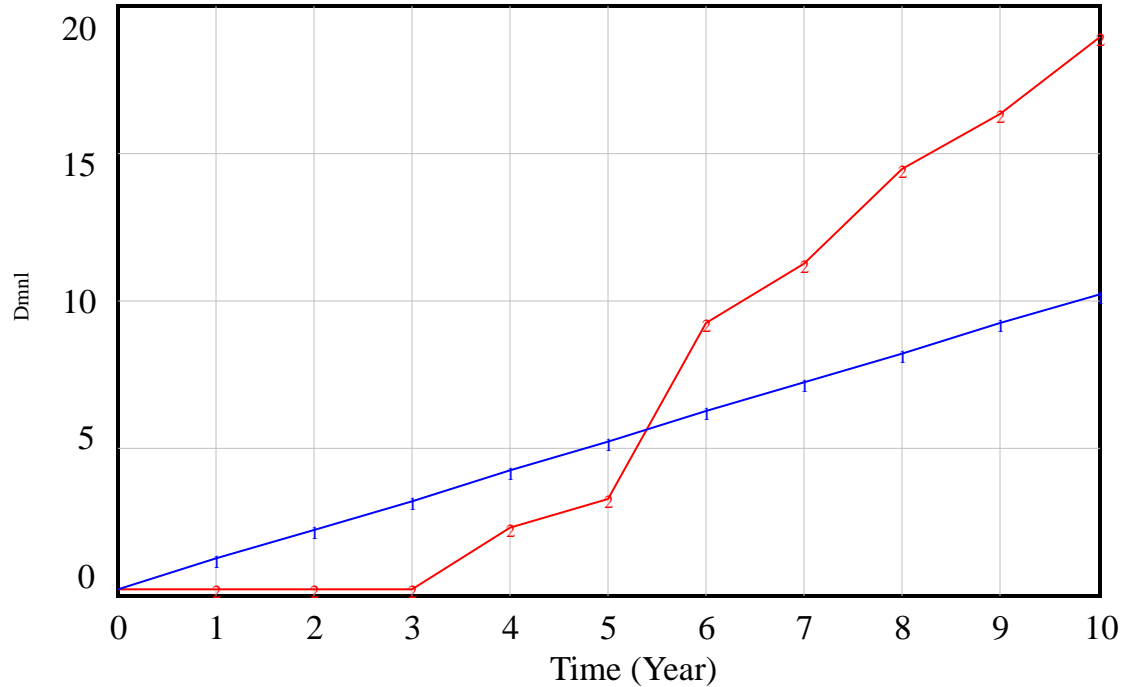
Business model of health-care and residents cooperation



# Results of simulation of cooperation model among medical treatment, nursing care and residents

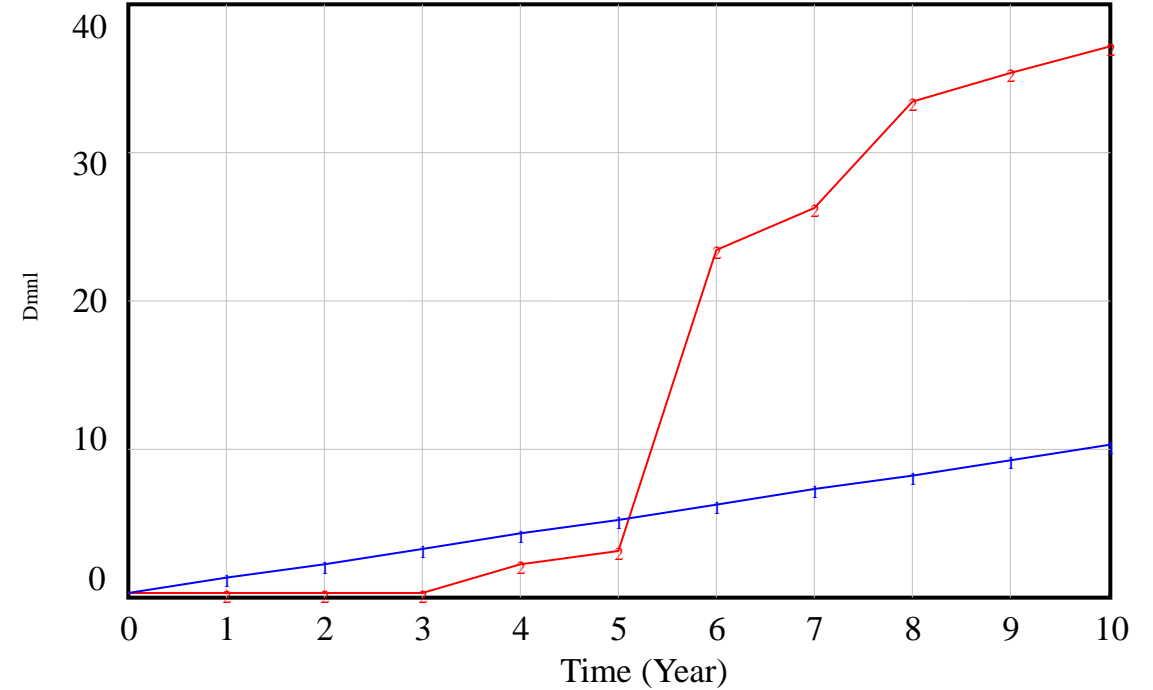
(Comparison of changes when doubling the value of effects)

Activation level along railroad tracks (safety, security, and trust)



Activation level along railroad tracks (safety, security, and trust): Current  
 Activation level along railroad tracks (safety, security, and trust): Care net service

Activation level along railroad tracks (safety, security, and trust)



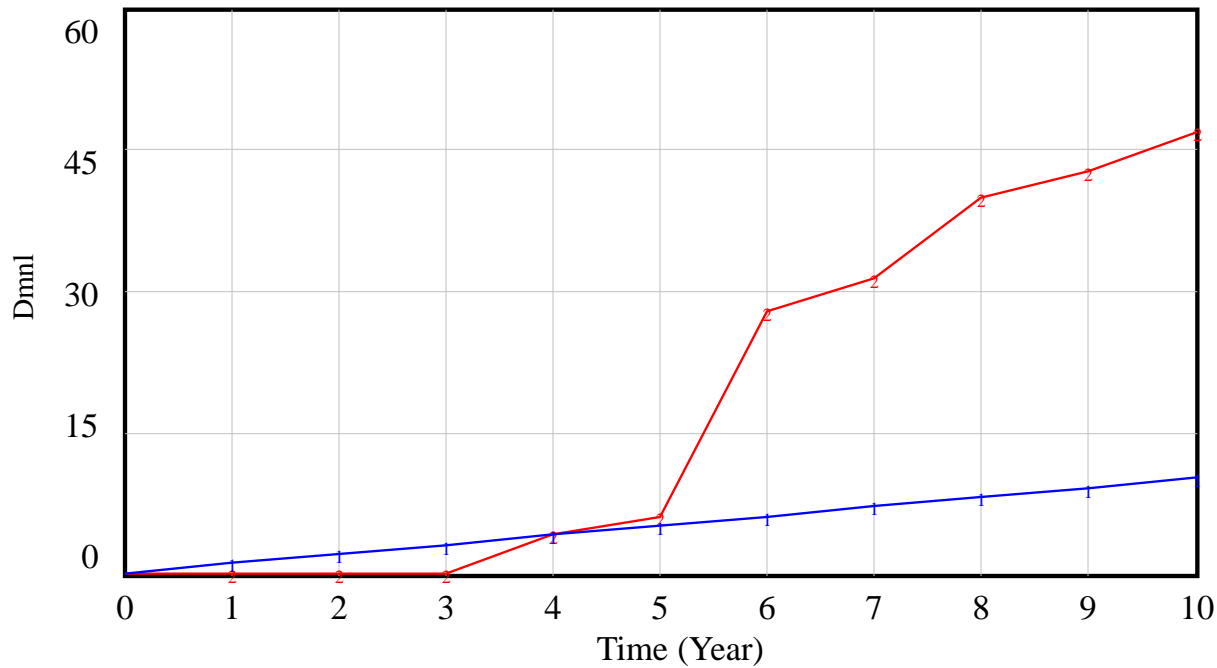
Activation level along railroad tracks (safety, security, and trust): Current  
 Activation level along railroad tracks (safety, security, and trust): Volunteer service

1. The increase of care net service improves the level of activation of the area along the railroad tracks

2. The enhancement of volunteer services improves the level of activation of the area along the railroad tracks

# Results of simulation of cooperation model among medical treatment, nursing care and residents along railroad

Activation level along railroad tracks (safety, security, and trust)



Activation level along railroad tracks (safety, security, and trust): Current  
Activation level along railroad tracks (safety, security, and trust): Social service

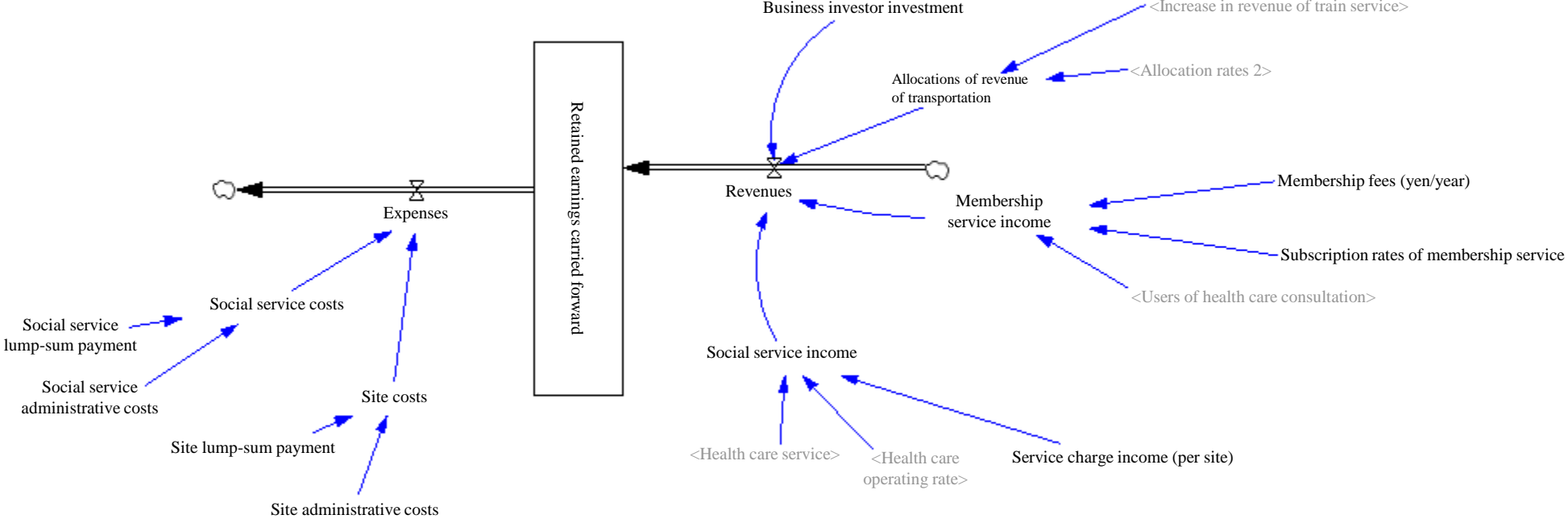
We studied the influence of the variation in the three factors such as care net services, volunteer services, and social services on the activation of the areas along the railroad tracks by conducting the SD model simulation.

The social services were most effective, and volunteer services were second best. As expected, the care net services which are provided for the users of medical/nursing care services did not activate the area as much as other services.

3. The enhancement of social services improves the level of activation of the area along the railroad tracks

# The models for revenue and expenses of cooperation model among medical treatment, nursing care and residents

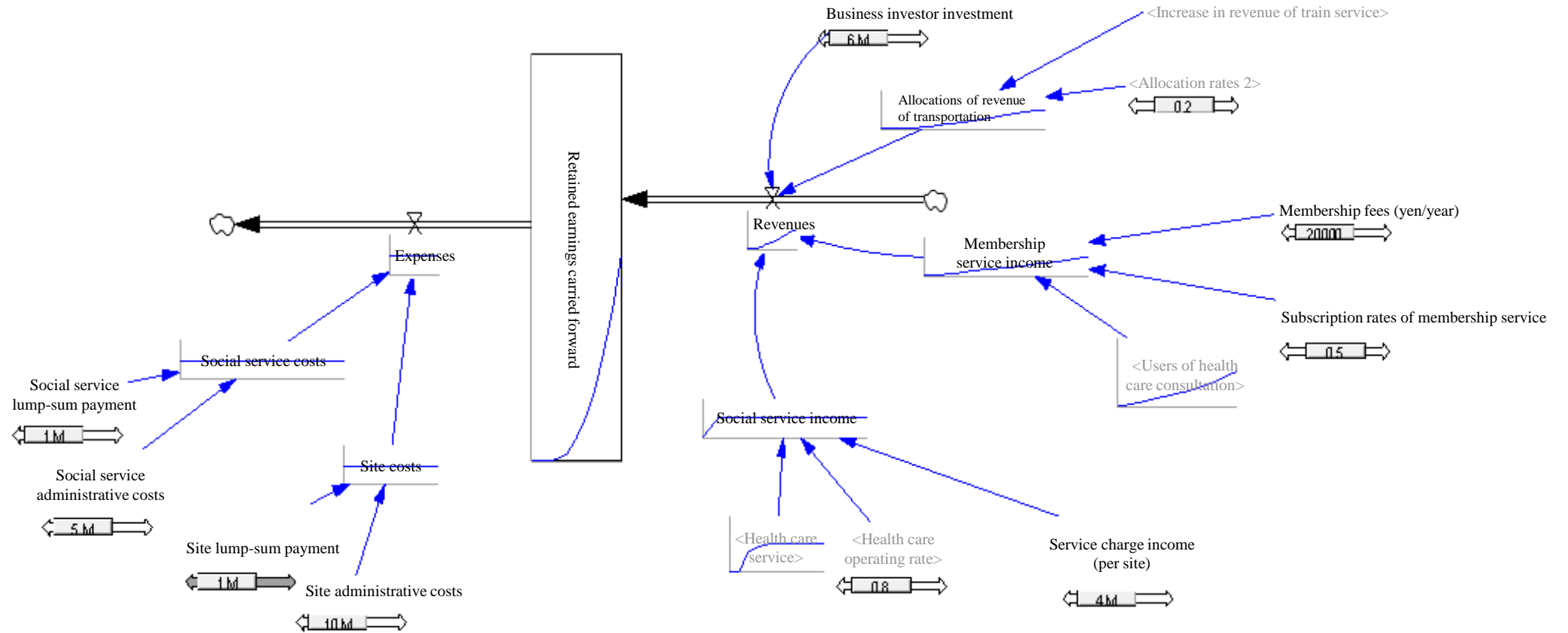
Revenues and expenses



<Time>

# The simulation of revenue and expenses of the cooperation model among medical treatment, nursing care and residents

Revenues and expenses



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# Discussion

- It is expected that the enhanced care net, volunteer, and social services would decrease the number of people staying indoors (the deactivated population), which would increase the use of tangible and intangible assets possessed by the railroad companies, increase social involvement of such people, and activate the areas along the railroad tracks.
- This study demonstrated that especially the enhancement of social services and volunteer services had strong effects on the activation. This result should be reflected on the concrete measures for the revitalization of local communities in the coming super-aging society.
- How to use the existing resources is important. We consider that if a new IT system with the health-care perspective is utilized, participatory communities where residents support each other including an increased number of diversified elderly people can be developed.

We plan to establish the SD models for revenue and expenses of such businesses.