Management of Suburban Built-Up Areas based on Forecast of Future Demographic Structure and Future Costs for Public Infrastructure and Services (Period of Study: From FY 2014 to FY 2016))

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1.　Foreword

In the existing single-family residential areas in city suburbs, we have been seeing the increasing costs of nursing care and welfare under severe fiscal constraints on local governments and the growing need for maintenance and renewal of public infrastructure, in addition to the aging and declining population, an increasing number of vacant and abandoned houses and properties, and an increasing number of closures of life-convenience facilities. These and other urban problems may likely become increasingly more serious going forward. As for the future management of suburban built-up areas, in order to help facilitate consensus building among dwellers and within administrative agencies, we consider it necessary to study the future image of each district by visualizing, based on objective data, the future prospect of demographic structure, quality of life of dwellers and public infrastructure and service costs there.

In this paper, we would like to present an example of cost estimates for future public infrastructure and services in suburban built-up areas as calculated by using the Simplified Cost-Benefit Evaluation Tool developed by NILIM.

2.　Example of Cost Estimates for Future Public Infrastructure and Services

We developed cost estimates for future public infrastructure and services, under three scenarios, using, as an estimation model, a single-family residential district A (area: 60.1 hectares, 2010 census population: 4,734, 1,827 households), which was developed in the early 1970s and is located within a 40–50 km radius of the Tokyo metropolitan area. Figure 1 shows cost estimates for future public infrastructure and services under Scenario 0, in which the size and level of public infrastructure and services are assumed to remain the same as currently exist. As can be seen, cost estimates for the renewal of a variety of infrastructure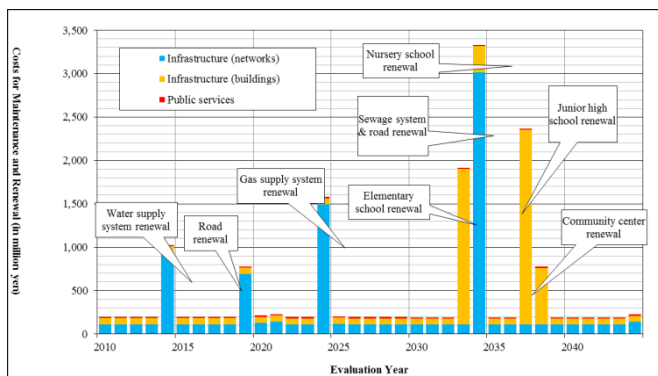 facilities with expired service life are exceptionally high. In addition, we established two other scenarios: Scenario 1, in which sewage systems, garbage collection services, and bus services will be rationalized; and Scenario 2, in which water supply and sewage systems, roads, electricity, and gas supply facilities will not be repaired and renewed in 2025 and onwards in some districts, and households there will be induced to move out to different districts. Figure 2 shows, by scenario, trends in the annual cost estimates for public infrastructure and services (five-year average of cost estimates for maintenance and renewal) and annual cost estimates per dweller. With Scenario 0 as a baseline, it is estimated that there will be a cumulative cost reduction of just above two billion yen under Scenario 1 and just below three billion yen under Scenario 2 during the period from 2010 to 2040.

3.　Conclusion

We plan to provide local governments with this Simplified Cost-Benefit Evaluation Tool, together with the Simplified Future District Image Forecasting Tool, which forecasts future demographic structure and the sustainability of life convenience facilities, among other things. We expect that these tools will be utilized to support the study and development of measures to guide and promote future management of suburban built-up areas and centralized urban planning.

☞For further information, please visit the following websites:
1) NILIM's report of 2015 entitled "Easy Forecast Methods of Future District Images to Prepare for the Well-Planned Downsizing or Restructuring of Cities"
http://www.nilim.go.jp/lab/bcg/siryou/2015report/ar2015hp101.pdf
2) NILIM's report of 2016 entitled "Simplified Cost-Benefit Evaluation Tool for the Operation and Maintenance of Public Infrastructure and Services in Suburban Built-Up Areas"
http://www.nilim.go.jp/lab/bcg/siryou/2016report/ar2016hp032.pdf

Figure 1. Example of cost estimates for public infrastructure and services (under Scenario 0)
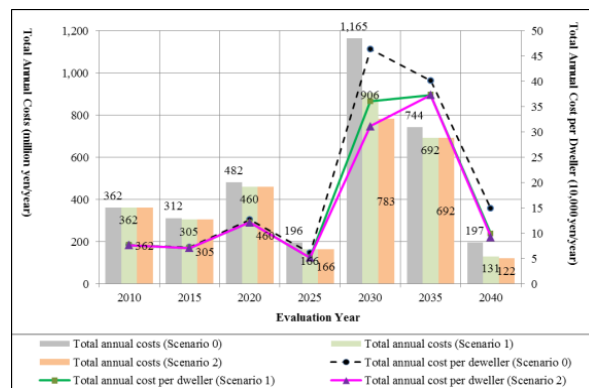

Figure 2. Annual cost estimates for public infrastructure and services and annual cost estimates per dweller by scenario