

Save a local town in 2040 by **Bus+Mobile Catering**

Nagoya University Affiliated Upper and Lower Secondary Schools

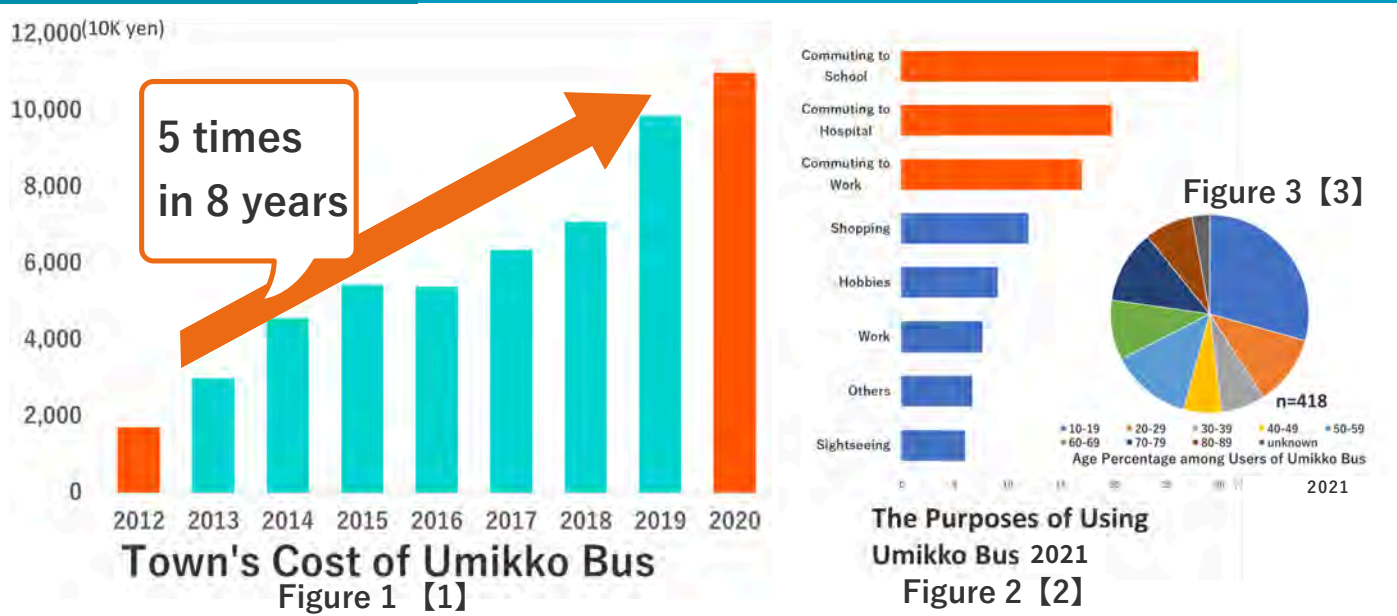


0 Our Target Municipality and the Current Situation

Vitalize a community bus and retail stores, helping the elderly's daily shopping in an aging society, with a bus equipped with mobile catering.

Minamichita is a town with 15000 people in Aichi pref., which is located a 70-minute ride from the nearest major city and the transportation within the town is limited to a community bus. Minamichita has been facing **low birthrate** and **aging population**. The proportion of the elderly is expected to increase rapidly, however, by 2040 the working-age population will decrease by 48% and the total population will decrease by 37%. Due to the **financial deterioration** caused by aging society, **public transportation services** are expected to shrink, making it difficult for the elderly to get around. Moreover, with the **decline** of tertiary industry, daily shopping has become increasingly challenging for the elderly. In this study, we analyzed data on the issues that Minamichita will face in the future, proposed a plan to solve these issues and considered the ideal town which Minamichita should be in 2040.

Problem 1 Crisis of Community Bus

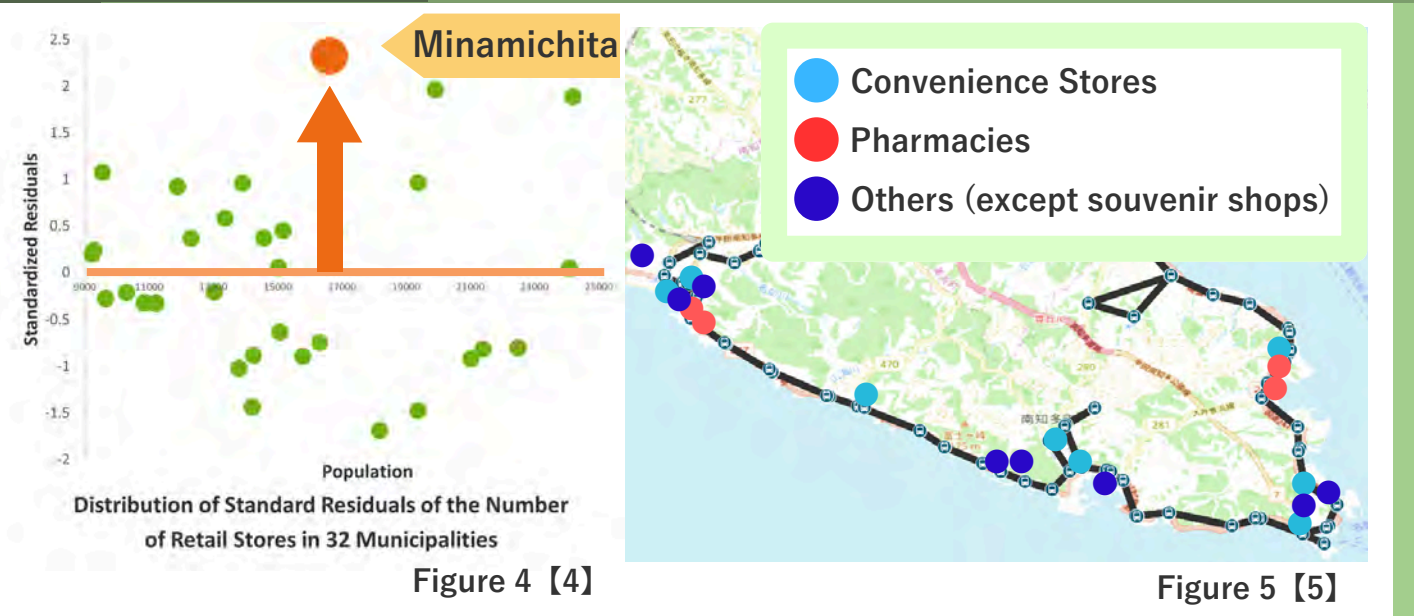


As the burden of cost for the bus on the town has increased, they are on the verge of extinction.

'Umikko Bus', 'sea kids' in English, is a public community bus that mainly circles Minamichita, which was scheduled to be abolished due to the deficits under private management. Figure [1] shows the change in the cost for the bus that the town covers. **The cost to the town is now five times higher than in 2012**, and fare revenues are far below the expenses. This is one of the factors making it difficult for the bus to continue to operate. Figure [2] and [3] show **many use the bus for commuting to work, school, and hospital and the bus is used regardless of ages**. Also, since there is no general hospital in the town, it is essential that the bus will survive as a transportation for the residents. However, **the number of passengers of the bus per day in 2012 was 740, while in 2022 it was still 789, with almost no change over the 10 years**. If it does not increase in the future, the bus service will not be able to continue because the bus is in red due to persistent financial deficits.

A proposal to increase new users and new income source is necessary.

Problem 2 Will Retail Stores Disappear?

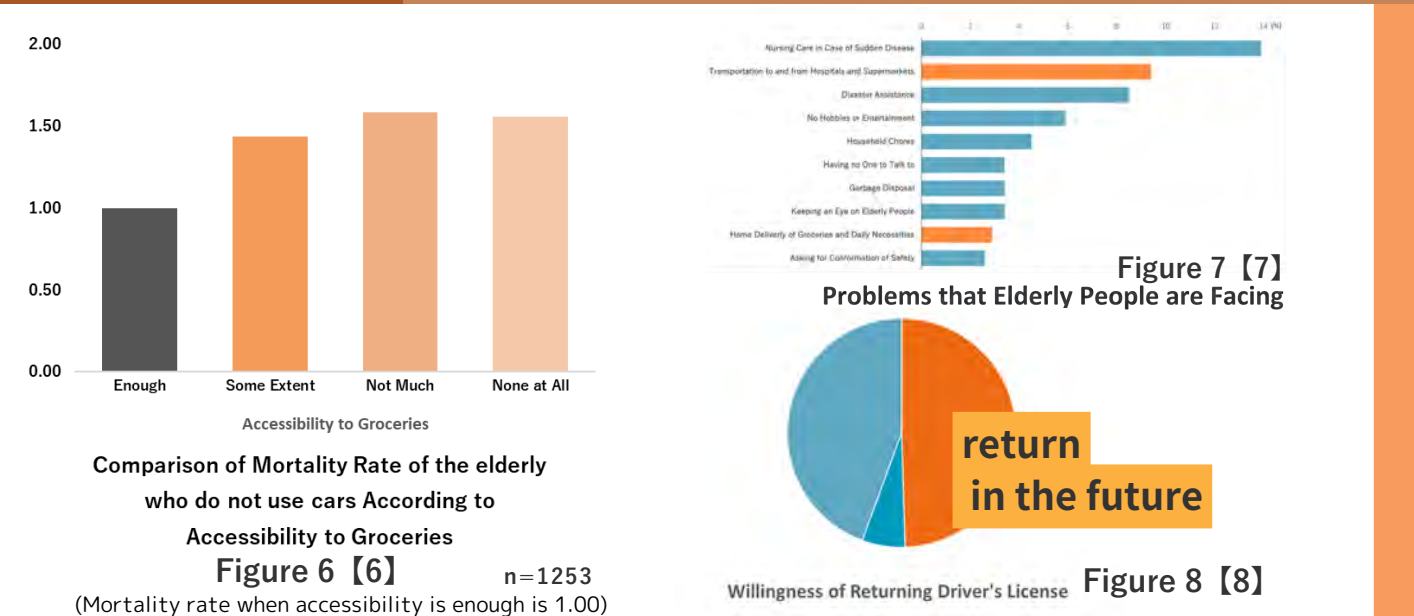


The number of retail stores, which was high in the past, has been decreasing.

We analyzed 32 municipalities similar to Minamichita in terms of population and area (population density between 80% and 120% and population between 50% and 150% of Minamichita). Figure [4] is the distribution of standard residuals of the number of retail stores. It shows **the number of retail stores of Minamichita is higher compared to that expected from population**. However, the **decline in retail stores** in Minamichita is **severe at 40.6%**, compared to the 32-municipality average of **24.2%**, which means **retail stores in the town are struggling to survive**. Figure [5] shows retail stores (individual stores) are **concentrated along seaside** where buses pass by. Moreover, there are **no supermarkets** that sell various daily necessities in the town. We attributed this decline in retail stores to a lack of retailer succession and fewer sales opportunities and thought addressing the lack of sales opportunities is our first step to solve retail stores decline.

A proposal to increase sales opportunities of retail stores is necessary.

Problem 3 Elderly Shopping Refugees



Elderly people are having difficulty shopping, which can have a negative impact on their health.

As explained so far, Minamichita is a town with a large elderly population and no supermarkets, so their shopping is in jeopardy. Figure [6], a study by Tokyo Medical and Dental University, shows that **among the elderly who do not use cars, inaccessibility to grocery stores increases the risk of death**. According to the survey of the citizens of Minamichita in Figure [7], both **the transportation to and from hospitals and supermarkets and home delivery of groceries and daily necessities are mentioned as problems by the elderly**. These issues indicate ongoing difficulties in daily shopping. According to the survey of the town citizens in Figure [8], **half of them plan to return their driving license**, which highlights the need for the access to grocery stores that residents can visit daily.

A proposal to save elderly shopping refugees and help their health is necessary.

4 Our Suggestion -Urikko Bus-

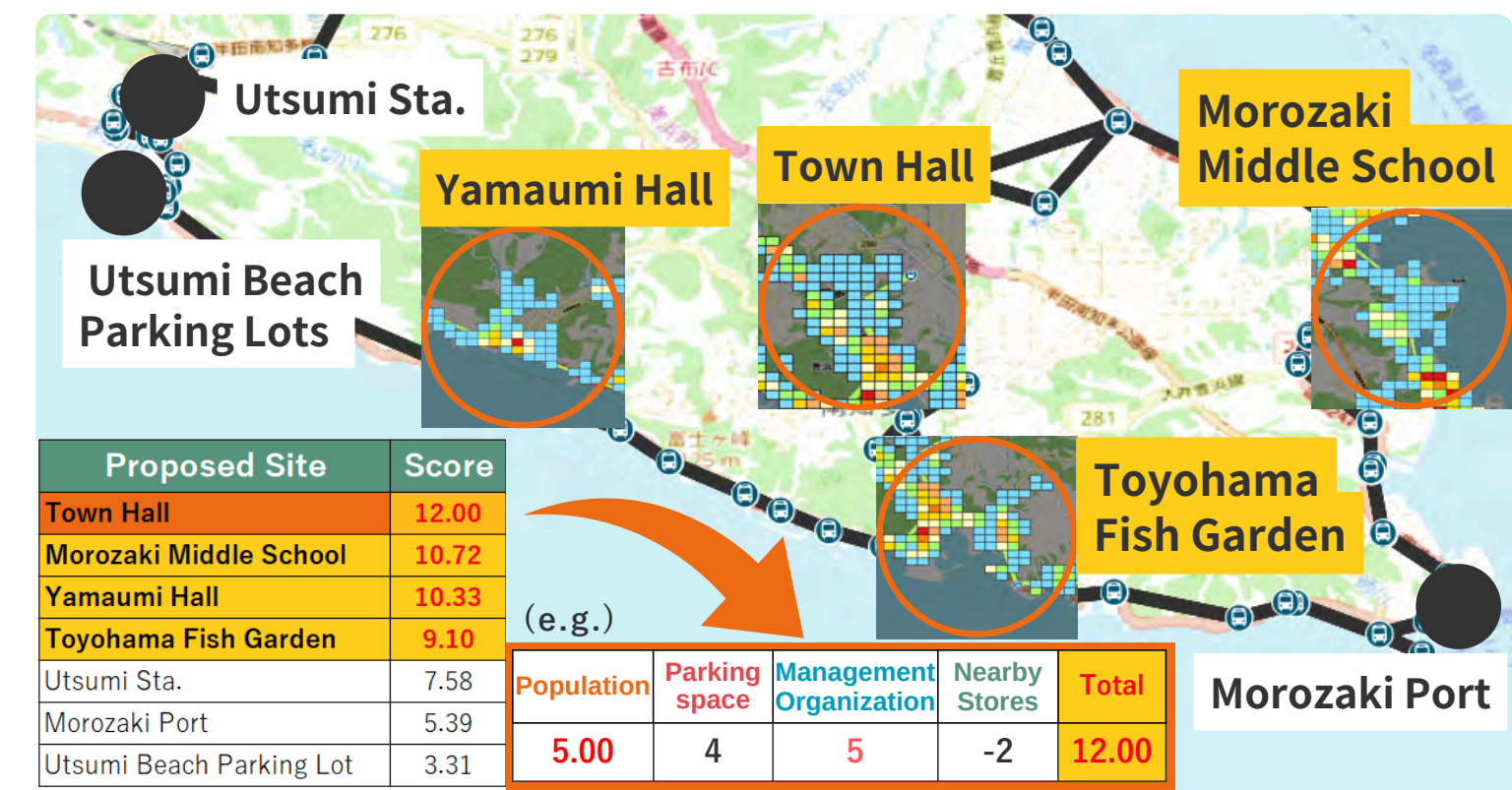
Based on analysis so far, Minamichita faces three challenges:
1 Public Transportation Maintenance
2 Retail Stores Decline
3 Elderly Retail Access

To address these challenges, we proposed **'Urikko Bus'** – a modified version of 'Umikko Bus' designed specifically for **mobile catering services**.

Solve these three problems with the **"Urikko Bus."**



5 Places to Operate Urikko Bus Service

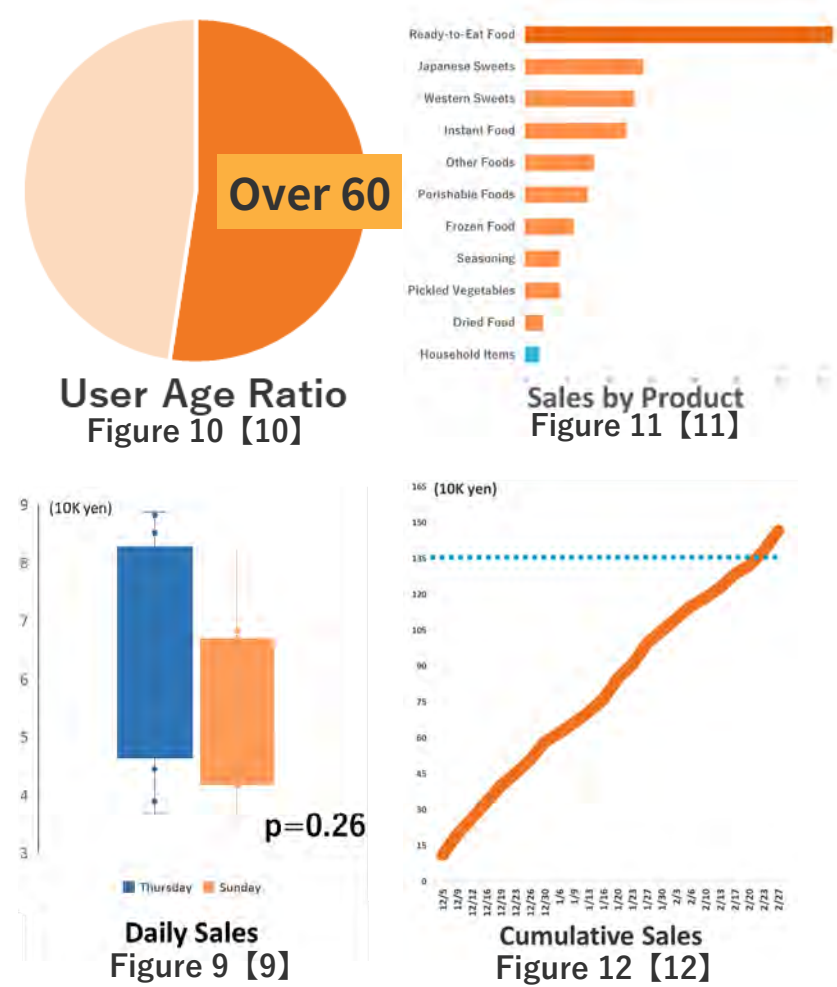


Selling goods on the roads is prohibited, We score proposed sites in terms of 4 Criteria
1 Population 2 Parking Space 3 Management Organization 4 Nearby Stores and select 4 locations.

- Population within a radius of 1km; calculating each sum value of the total population and the elderly population, the first place gets 5 points and the others are scored proportionally
- Parking space; 5 points if it is in a good condition, 4 points if it is not available under certain conditions, 3 points if it is not available for long periods of time due to peak season, 2 points if it is under construction
- Management Organization; 5 points if it is managed by Minamichita, 4 points if it is a public site, 3 points if it is a private site with high feasibility, 2 points if it is a private site with low feasibility
- The Number of Convenience Stores and Drugstores within a radius of 1km; Minus 1 point per a store

We selected 4 places from the total scores of these 4 criteria above. **Town Hall**, the 1st candidate, is a good location with a large population and easy access from both mountainous area and sea coast. The 2nd candidate, **the former Morozaki Middle School**, is highly feasible because parking is available on the grounds of the closed school. The 3rd candidate, **Yamaumi Hall**, is a town-owned facility with sufficient space and there are few convenience stores in the vicinity, so it is considered to be in demand. **Toyohama Fish Garden**, which is selected as the 4th candidate, will be considered for implementation only on weekdays due to the crowded parking lot on weekends.

6-1 Verification 1- A Precedent Case-

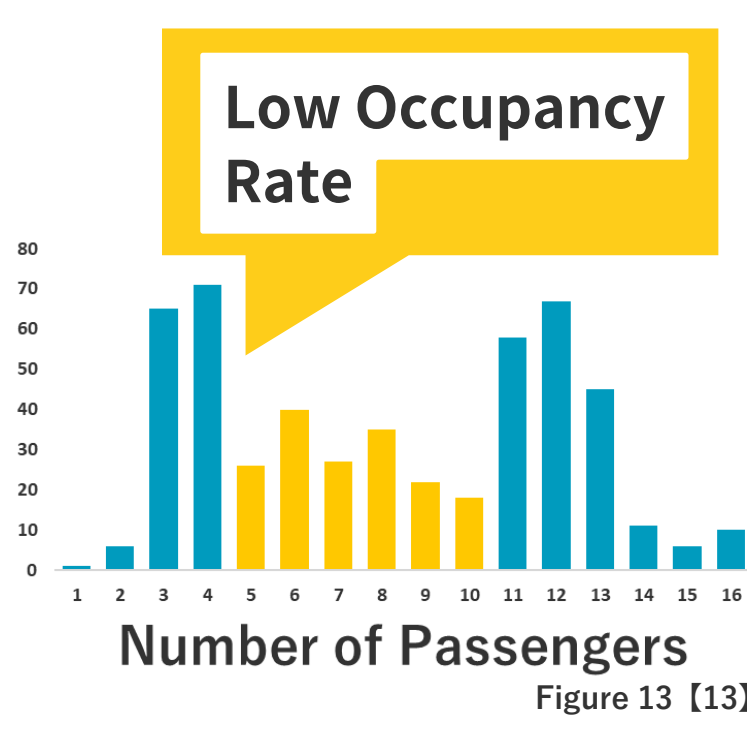


According to a precedent case, the majority of users of a bus with mobile catering are the elderly, and food sales are high.

The Marche Bus, an experimental bus, which combined the functions of both transportation service with mobile catering was in operation in 2022. The back half of the bus was used as a store, carrying goods from nearby department stores for sale. Figure 9 shows a comparison of sales on Thursdays and Sundays during the operation of the Marche bus, showing **no significant difference in sales between Thursday and Sunday**. A graph of the customer base for the Marche bus in Figure [10] shows that more than half of the customers are over 60, which suggests **high demand from seniors who have difficulty shopping**. According to Figure [11], the majority of the sales are food, especially **ready-to-eat food**.

In addition, Figure [12] showed that the Marche Bus sold 1.5 million yen as total sales, **exceeding the 1.35 million yen, the minimum required for continuing in business**. Therefore, the introduction of such a mobile catering vehicle can be a new revenue source for town's bus.

6-2 Verification 2 -A Plan in Detail-



Offering daytime sales to the elderly in a way without affecting the current bus schedule and renting space to retail stores for sale.

Based on verification 1, targeting senior citizens, the bus will **sell foods and daily necessities during the daytime on weekdays and holidays. The space of the bus will be rented out to retail stores as "sales space"** for a fixed price, so the price of goods will not rise as much as when products are bought directly from retail stores. 'Urikko Bus' loads daily necessary goods and sells them at spots where it can be parked for a long time during daytime. Figure [13] shows the bus service has **low occupancy rate between 9am and 2pm**, so the back half of the bus seats could be used for mobile catering during the time. Currently, clockwise bus and counter-clockwise one are in operation, and our proposal is to operate one bus as a 'Urikko Bus' (Selling Bus) and the other bus as usual transportation service while 'Urikko Bus' are selling, which has **minimal impact on the existing timetable**. 'Urikko Bus' will return to its regular transportation operation once its sales are completed.

1 New users and stable income for Umikko Bus

2 Increased sale opportunity for retail stores

3 Helping elderly shopping refugees

The proposal will provide a place for local residents to relax and a chance for the elderly to go out and chat with each other. The whole town will be vitalized through 'Urikko Bus'.

Reference

RESAS 地域経済分析システム, Google map [5], 南知多町「令和5年10月～海っ子バスが生まれ変わります!」令和3年度 事業報告(公共交通対策事業費関連) 海っ子バスの導入・歳出推移表 [1], 南知多町高齢者福祉計画・介護保険事業計画策定に関する実態調査 [7.8] 令和5年度南知多町生活交通確保維持改善計画 令和4年度 南知多町 一般会計予算【公共交通対策事業費関連】南知多町地域公共交通計画【令和5年度改訂版】独立行政法人統計センター「SSDSE(教育用標準データセット)」[4], アバマンショップ「愛知県市区町村別 スーパーの数ランキング」南知多町高齢者福祉計画及び第九期介護保険事業計画 電車とバスの写真館「十勝バス 191号車」R5年度バスOD調査・アンケート報告 [2.3.13], 東京医科歯科大学「近隣に食料品店が少ないと死亡リスク1.6倍」[6], 政府統計の総合窓口 e-Stat「地図で見る統計 (JSTAT MAP)」国土地理院地図 十勝バスマルシェバス報告書 [9.10.11.12] 南知多町「令和6年4月1日～ 新時刻表」