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## Evaluation of elderly-friendly open space and public service buildings in madiun city using importance performance analysis (IPA)

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### ABSTRACT

The Age-Friendly City Policy in Madiun City aims to improve the quality of life for the elderly by providing friendly and easy access to open spaces and public buildings. However, challenges in implementation may include appropriate infrastructure management and effective international policies to ensure the availability and availability of services that meet the needs of the city's aging population. This research aims to bridge the perception gap and provide concrete recommendations for improving Madiun's elderly-friendly infrastructure. This research is a development evaluation with a mixed approach (mixed method). The research sample includes various parties, starting from the Madiun City government, which is involved in planning and implementing development for the elderly in Pangongangan Village, the city center, who are users and beneficiaries of these facilities. The data analysis method in this research consists of quantitative and qualitative analysis. Based on the analysis, the majority of the construction of open space facilities and public service buildings in Madiun City is in accordance with development needs, according to the perception of the government and older people. Both parties were satisfied with the development results, especially on items of high essential and performance. However, there needs to be more perception between older people and the government regarding items considered necessary. This shows the need for synchronization between government perceptions and the needs felt by elderly people in developing elderly-friendly infrastructure.



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## Introduction

Technology and science are currently experiencing extraordinary developments in various fields. Humans can now easily carry out their daily activities and improve their quality of life (Yoga, 2019; Al, 2023). Cultural changes that emerge along with technological developments also influence people's mindsets. For example, women today tend to have fewer children and have them at a later age (Hanum & Andiny, 2018). These changes are recorded in the megatrend world, including demographic changes, migration, urbanization, climate change, and technological change (Trask, 2020). Demographic changes are one of the most fundamental changes in society (Chomik & Piggott, 2021). Deep demographic changes megatrend is divided into several events, but the

most pressing is population aging (Podgórnjak-Krzykacz et al., 2020). (World Bank, 2023) shows that the elderly population has continued to increase since 2014.

The increase in the elderly population can have social, economic, and health implications (Tang et al., 2022). Thus, policies and programs are needed to overcome problems that may arise (Mensah, 2024; Otsu & Shibayama, 2022). Challenges in these areas require government intervention that can improve the quality of life of the elderly (Cheng et al., 2019). WHO, in this case, provides guidelines regarding developing cities that are friendly to the elderly (age-friendly city). Senior-friendly cities encourage active aging by increasing urban health, participation, and safety opportunities as people age (Bastani et al., 2016). Building an age-friendly city aims to make the current physical, social, and policy environment more elderly-friendly. (WHO, 2007:1-75) (Van Hoof et al., 2021). Indonesia faces the challenge of population aging, with around 29.3 million elderly adults in 2021, equivalent to 10.82% of the total population (BPS, 2022). The government needs to ensure the quality of life of the elderly through policies, such as Law No. 13/1998 and Law No. 40/2004 (Madiun City Government, 2019), including the National Social Security System. East Java Province is leading in implementing elderly-friendly city planning regulations, with Madiun City as an example. Madiun City, with the highest percentage of elderly adults in East Java, shows commitment to responding to the growth of elderly adults. (Lestari et al., 2022; Statistik, 2020).

The elderly are more vulnerable, both socially, economically, and health-wise. Thus, the comfort, accessibility, and safety of open spaces and public service buildings in their area greatly influence their lives (Othman & Fadzil, 2015; Xu et al., 2022). Based on this, research on developing an elderly-friendly city in Madiun City focuses on open spaces and elderly-friendly public service buildings. Policies in providing open space facilities and elderly-friendly public service buildings have begun to be implemented in Madiun City. This development was based on the WHO guidelines for indicators of elderly-friendly cities (2007) (Indrawaty & Prabawati, 2016). The Madiun City Government is building an elderly cottage that provides the elderly with needed facilities. Based on the explanation above, it can be seen that the government has carried out various interventions through policy and development to support the lives and welfare of the elderly. However, the direct impact on the elderly is still unknown. Previous research shows that development aimed at the elderly also needs to pay attention to the needs and mobility of the elderly. Thus, that it is not misdirected and is appropriate for use (Lestari et al., 2022; Loukaitou-Sideris et al., 2019).

This research is novel in terms of methods for evaluating the construction of open-space facilities and elderly-friendly public service buildings. Evaluation of the construction of open spaces and public service buildings using the mixed method with importance-performance analysis (IPA) and interviews. The scientific method determines individual perceptions and their significance to that individual (Kelly et al., 2023). A qualitative follow-up analysis was carried out to identify the reasons for the essential of each indicator of open space and public service buildings as well as aspects of open space and public service buildings that need to be improved from the development that has been carried out. The empirical novelty of this research is that it applies the WHO (2007) elderly-friendly city indicators to public service buildings. Researchers focus building indicators on public service buildings, considering that public services are one of the vital needs for the elderly. Thus, public service buildings are needed to facilitate their unique needs. This is also a form of improvement and equalization of services from the Madiun City government.

The WHO guidelines for age-friendly cities suggest various strategies to improve the quality of life of seniors through supportive environments. This includes better accessibility to public infrastructure, health services, transportation, and social activities that promote intergenerational integration. In the context of Madiun City, the application of these guidelines can be implemented by increasing the accessibility of public facilities such as sidewalks that are friendly to the elderly and public toilets that suit their needs. Apart from that, it is also necessary to increase access to health services that suit the needs of the elderly, as well as providing public spaces that support inclusive social activities and promote their active participation in community life. Thus, implementing WHO guidelines can help Madiun City to become friendlier towards the elderly by ensuring that their needs and rights are properly met in everyday life.

Based on the explanation of the background to the problem, this research question consists of: 1) What is the government's perception of open space facilities and elderly-friendly public service buildings in Madiun City? 2) What are seniors' perceptions regarding open space facilities and senior-friendly public service buildings in Madiun City? 3) How has the goal of providing open space facilities and elderly-friendly public service buildings been achieved in Madiun City? Based on the research formulation, the main objectives of this research are to 1) determine the similarities and differences in perceptions of the elderly and the government regarding open space facilities and elderly-friendly public service buildings in Madiun City and 2) find out to what extent the goal of providing elderly-friendly facilities in Madiun City has been achieved.

Developing senior-friendly cities is very important because this can bring a number of significant benefits. Firstly, by providing seniors with easy and welcoming access to open spaces and public buildings, it can improve their physical and mental health by encouraging healthier active and social lifestyles. Second, it promotes social inclusion by creating an environment that enables intergenerational interaction and active participation in community life. Third, elderly-friendly cities can improve the overall quality of life of elderly people by meeting their needs for safety, accessibility and integrated public services. Thus, developing an elderly-friendly city not only creates a better environment for the elderly, but also brings broad benefits to the entire community in building an inclusive and sustainable city.

Research (Fatmah et al., 2019) found that Depok was not ready to become an age-friendly city due to its many infrastructure deficiencies. There are few facility changes, such as infrastructure improvements to existing age-friendly city indicators and regulations, except for buildings and green open spaces. Depok still needs time to reach an age-friendly city where people will have an excellent place to live, grow, and grow old. Previous research also evaluated elderly-friendly city policies. The novelty of this research is compared to previous research. Researchers analyze the achievements of development that have been implemented, whereas the last research was still limited to evaluations before development implementation and only involved internal development implementers. Similar research was also conducted by (van den Berg et al., 2020) which found that to make it easier for nursing home residents to access the outdoors, it is essential to have a garden with seasonal plants and interactive features, seating that is protected from the weather, doors that can be controlled. On accessible thresholds, scheduled social activities, and appropriate clothing.

This research aims to bridge the perception gap and provide concrete recommendations for improving Madiun's elderly-friendly infrastructure. Researchers evaluated the development program based on the perceptions of two groups: the government as the implementer of development and the elderly as users of development. By knowing the gap in perception regarding the needs of the elderly between the government and the elderly themselves, this research can show the achievements of the development of open spaces and public service buildings implemented in Madiun City.

## Method

This research is a development evaluation with a mixed approach (mixed method) integrating quantitative and qualitative analysis to understand elderly-friendly public service building facilities in Madiun City comprehensively. Quantitative analysis was carried out using the method Importance-Performance Analysis (IPA) to measure the level of importance and performance of each indicator related to open space and public service buildings. In the Importance-Performance Analysis (IPA) method, specific criteria for triggering the importance and performance of each indicator related to open space and public service buildings include two main steps. First, identify the relative importance of each indicator based on responses from diverse stakeholders, such as local communities, visitors, and local governments. Second, assess the current performance of each indicator using appropriate field observation or audit data. By depicting importance to performance in the IPA matrix, this evaluation helps identify improvement priorities, allows to focus on areas of high importance but currently low performance, and allocates resources more efficiently to improve the experience and benefits of open spaces and public facilities.

Researchers conducted interviews simultaneously to identify highly significant indicators and explore similarities and differences in perceptions between the elderly as facility users and the government regarding open space facilities and elderly-friendly public service buildings in Madiun City. This research was conducted in Madiun City for relevant demographic and development policy reasons. This research variable consists of green open spaces, public service buildings, and evaluations based on government perceptions and the perceptions of the elderly. The population of this research is the Madiun City Government and Madiun City Elderly. The sampling method in this research uses a purposive sampling approach to select participants who have relevant knowledge about government and community perceptions of open spaces and elderly-friendly buildings in Madiun City. This selection was made to ensure that the data obtained was in accordance with the research objectives.

The research sample includes various parties, starting from the Madiun City government, which is involved in planning and implementing development for the elderly in Pangongangan Village, the city center, who are users and beneficiaries of these facilities. To overcome potential bias in participant selection, I will use an inclusive approach that includes diverse age groups and viewpoints, including the elderly and the government in Madiun City, to ensure balanced representation in evaluating the importance and performance of open spaces and public service buildings using the Importance method -Performance Analysis (IPA). This research uses several data collection methods. First, a questionnaire was designed using the Importance-Performance

Analysis (IPA) model and a 1-4 Likert scale to assess the importance and performance of various aspects of elderly-friendly public service building facilities. *Importance performance analysis was carried out using a 4-rank Likert scale with each weight shown in the following table.*

**Table 3.** Weighting of Importance Level and Performance Level

Categori	Criteria	Scor
(Importance)	Very unimportant	1
	Not important	2
	Somewhat Important	3
(Performance)	Very Important	4
	Very unimportant	1
	Not important	2
	Somewhat Important	3
	Very Important	4

Second, interviews were conducted using a semi-structured approach, exploring the government's and the elderly's perceptions of their needs. Third, direct observations were made of infrastructure development carried out by the Madiun City government, focusing on eight WHO indicators for open spaces and public service buildings. Finally, documentation studies analyze related regional regulations, development reports, policies, and other relevant sources. With this combination of methods, this research can provide comprehensive insight into the perception and reality of building elderly-friendly facilities in Madiun City.

The data analysis method in this research consists of quantitative and qualitative analysis. Quantitative analysis was carried out using the importance-performance analysis (IPA) approach to eight indicators of open space and public service buildings, according to WHO (2007). IPA steps include weighting the level of importance and performance, calculating suitability values, and representation in a Cartesian diagram. Next, qualitative analysis follows the approach of Miles and Huberman (2014). The stages include data collection through in-depth interviews, observations, and document studies, followed by data condensation to identify patterns and critical findings. Temporary conclusions are drawn, and then the data is presented visually in a research report along with findings and recommendations for the development of Madiun City. With this combination of methods, this research can provide a comprehensive understanding of perceptions and evaluations of elderly-friendly infrastructure in Madiun City.

## Results and Discussions

### Results of Frequency of Use of Open Space Facilities and Public Service Buildings for the Elderly in Madiun City

Researchers analyzed the frequency of use of open space facilities and public service buildings specifically for the elderly in Madiun City. This can show what facilities are often used by the elderly. The research results on the frequency of use of these facilities are shown as follows.

**Table 1.** Perceptions of the Elderly on Frequency of Use of Open Space Facilities and Public Service Buildings Specifically for the Elderly in Madiun City

WHO Version Concept	Rata-Rata			Standard Deviation		
	Elderly	Government	Gap	Elderly	Government	Gap
Madiun City Environment	3.8	3.7	0.1	0.60	0.47	0.13
Green open space	3.5	3.2	0.3	0.77	0.43	0.34
Public Rest Area	3.0	3.4	0.4	0.98	0.75	0.23
Sidewalk	3.4	3.4	0	0.76	0.50	0.27
Road Crossing	3.4	3.1	0.2	0.81	0.77	0.04
Accessibility	3.4	3.1	0.2	0.86	0.66	0.20
Safe Environment	3.8	3.7	0.1	0.37	0.47	0.09
Special Pedestrian and Bicycle Paths	3.4	3.1	0.3	0.71	0.66	0.05
Public toilet	1.9	2.6	0.7	1.00	0.76	0.24
Elderly Friendly Customer Service	3.6	2.6	1	0.57	0.84	0.27

(Source: Primary data processed by researchers, 2024)

The average gap of 0.1 in the Madiun City environment indicates that the elderly have a slightly higher perception (3.8) than the government (3.7) regarding the frequency of use of Madiun City environmental

facilities. Although the difference is slight, this shows that older adults use Madiun City environmental facilities more often compared to the government's perception. The standard deviation gap of 0.13 indicates that the variation in the elderly's perception of the Madiun City environment is higher than in the government's. This shows that older people give more varied or scattered assessments than average, while the government has more consistent perceptions.

The average gap of 0.3 shows that older adults generally give a higher assessment of the frequency of use of Green Open Space compared to the government. This significant average gap indicates a tremendous perception difference between the two groups regarding Green Open Space. The standard deviation gap of 0.34 shows significant variations in the perception of the frequency of use of Green Open Space between the elderly and the government. This means that there are differences in means and considerable variation in how consistent the views are between the two groups. The elderly gave a lower average assessment of Public Rest Areas compared to the government's perception, which was 3, while the governments were 3.4. This shows that the elderly perceive the frequency of using public rest areas less frequently than the government. Interview results show that most older adults think there needs to be more seating. Several elderly residents of Madiun City conveyed this:

"Seating availability is still lacking" (Widarsih, Elderly Citizen, 67 Years)

"There are no seats for the elderly yet" (Sunarti, Elderly Citizen, 65 years old)

"There are not enough seats specifically for the elderly" (Lilie Sumarti, Senior Citizen, 71 years old)

The statement above shows that older adults rarely use public rest facilities because there is still a lack of seating in public places, especially for the elderly. This shows that the lower frequency gap in the elderly is due to the unavailability of adequate facilities for the elderly. The frequency analysis results show no difference in the average between the perceptions of the elderly and the government regarding sidewalks, namely 3.4. Both groups gave the same assessment of the frequency of using Sidewalks. Although there is no difference in means, a standard deviation gap of 0.27 indicates a significant variation in the perception of the frequency of use of Sidewalks between seniors and the government. The high standard deviation for the elderly, namely 0.76, shows differences in the need for sidewalk use. Sidewalks are specifically for pedestrians. Thus, older adults who walk and use public transportation have a higher frequency of use than older adults who own vehicles.

The elderly gave a higher average rating of 3.4 for road crossings than the government's perception of 3.1. This shows that road crossings are a widely used facility by the elderly. Although there is a slight difference in means, the tiny standard deviation gap (0.04) indicates that the variation in the perception of the frequency of use of Crossings between the elderly and the government is almost non-existent. This shows that the views regarding road crossings are consistent between the two. Seniors gave a higher average rating of 3.4 for accessibility than the government's perception of 3.1. Although there is a relatively small mean difference, the reasonably sizable standard deviation gap (0.20) indicates significant variation in the perceived frequency of Accessibility use between seniors and the government. This indicates that, although seniors and governments may tend to be on the same page on average, there is variation in how consistent views are between individual seniors and governments regarding accessibility.

Seniors gave a slightly higher average rating of 3.8 for a Safe Environment than the government's perception of 3.7. The relatively small standard deviation gap (0.09) indicates that the variation in the perception of the frequency of use of Safe Environments between the elderly and the government tends to be not significant. This shows that the views regarding environmental security are consistent between the two. The elderly gave a lower average assessment of public toilets, 1.9, compared to the government's perception, which was 2.6. The reasonably sizable standard deviation gap (0.24) indicates a significant variation in the perception of the frequency of use of public toilets between the elderly and the government. Seniors gave a higher average rating of 3.6 for Elderly Friendly Consumer Services compared to the government's perception of 2.6. A relatively large standard deviation gap (0.27) indicates significant variation in the perception of the frequency of Elderly Friendly Consumer Services between the elderly and the government. This indicates that their views vary substantially regarding Customer Service in Madiun City.

#### **Analysis Results Importance Performance Analysis**

Researchers analyzed the level of importance of each open space facility and public service building specifically for the elderly, which consists of ten aspects: a comfortable and clean environment, green open space, public rest areas, sidewalks, road crossings, accessibility, safe environment, paths specifically for pedestrians and bicycles, public toilets, and elderly-friendly customer service. Researchers also analyzed policy evaluations based on the views of elderly people as facility users.

The data processing was carried out using SPSS 27. Each aspect was analyzed using several items. Researchers labeled each item to simplify the data processing process. Each item is labeled as follows.

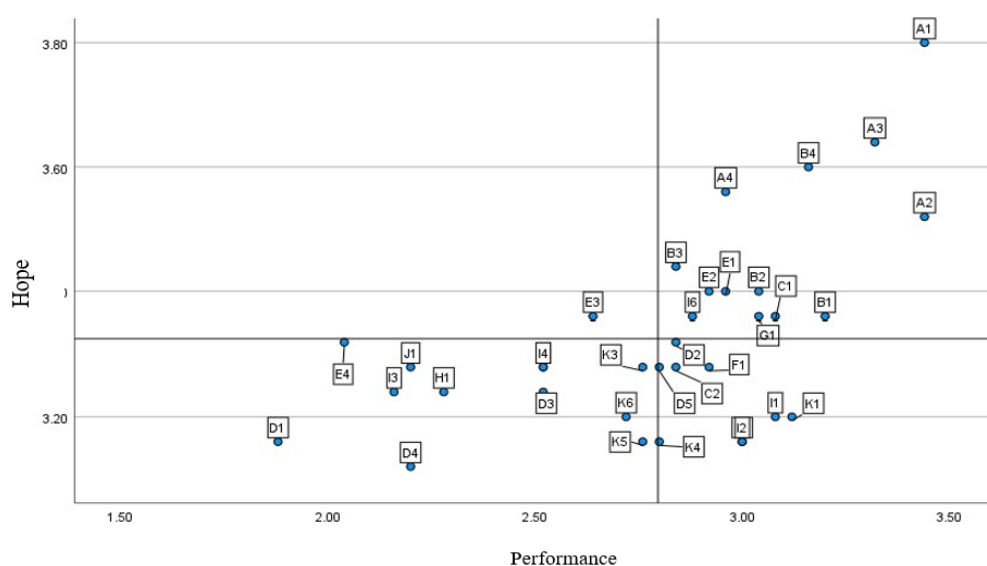
**Table 2.** Items Analyzed

<b>Label</b>	<b>Item</b>
Fun and clean environment (A)	
A1	Madiun city has beautiful parks
A2	Madiun City has shady trees
A3	Madiun City has open areas with places to rest and socialize
A4	Madiun City has clean open spaces and public service buildings.
Green Open Space (B)	
B1	Green open space that can be used for walking, gardening or light exercise
B2	Relax and socialize in green open spaces
B3	Green open space that is easily accessible, comfortable and safe
B4	Clean and safe green open space
Resting Place (C)	
C1	Rest area or comfortable public seating in a green open space
C2	Rest areas or comfortable public seating in public service buildings
Elderly Friendly Roads or Sidewalks (D)	
D1	Existing sidewalks can be used to get to green open spaces or public service buildings
D2	The sidewalks in Madiun City are wide and comfortable so they can be used by pedestrians and wheelchair users
D3	I can get on and off the curb easily and without getting tired
D4	There are no obstructions on the sidewalk, such as trees, street vendors, haphazardly parked vehicles, or other objects.
D5	Madiun City road sidewalks do not have holes and are not slippery.
Safe Road Crossing (E)	
E1	Road markings, traffic lights and crossing signs are clear and bright
E2	The duration of the crossing is sufficient to walk without rushing
E3	There are officers or barriers that protect the crossing from motorists
E4	There are special warning signs such as "Beware of the Elderly" or "Elderly Friendly Zone" in the road crossing area
Accessibility (F)	
F1	Facilities, infrastructure and services around green open spaces and public service buildings are easy to find and reach
Safe Environment (G)	
G1	Madiun City is a safe place to travel, both from thieves and the threat of other criminal acts.
Pedestrian and Bicycle Path (H)	
H1	Pedestrian and cyclist paths are separated by physical barriers from other vehicle paths.
Decent public toilet (I)	
I1	The location of public toilets in green open spaces can be found and reached easily
I2	The location of public toilets in public service buildings can be searched and reached easily
I3	There are special toilets for disabled people or wheelchair users in the green open space
I4	There are special toilets for disabled people or wheelchair users in public service buildings
I5	Public toilet in clean green open space.
I6	Public toilets in public service buildings are clean.
Elderly friendly customer service (J)	
J1	Public service buildings in Madiun City provide separate queues specifically for the elderly.
Policy Evaluation (K)	
K1	The construction of open spaces and public service buildings is important to meet the needs and support the welfare of the elderly in Madiun City.
K2	The budget used for the construction of open spaces and public service buildings is quite efficient.
K3	The construction of open spaces and public service buildings is sufficient to meet the needs of the elderly.

Label	Item
K4	The construction of open spaces and public service buildings can encourage equality for the elderly. Thus, that the elderly are not hampered in carrying out activities and moving around, and can actively participate in social interactions in their environment.
K5	The construction of open spaces and public service buildings can meet the needs, preferences and values of the elderly group.
K6	Existing open space buildings and public service buildings are in accordance with the aim of elderly-friendly development.

Source: data processed from WHO (2007)

The main analysis of this research is a comparison of perceptions between the elderly and the government regarding the construction of open spaces and public service buildings specifically for the elderly in Madiun City using techniques of importance-performance analysis. Analysis of the expectations and performance of the elderly is separated and compared from the perception of the government's expectations and performance to find if there is a gap in the perception of the government as a policy maker and implementer and the elderly as policy users. Quadrants are assigned based on expectations and performance levels, helping to identify aspects that have met or exceeded expectations and those that require further improvement. Analysis results the importance of performance analysis in elderly residents is shown as follows.



**Figure 1.** Perceptions of the Elderly on Expectations and Performance of Open Space Facilities and Public Service Buildings for the Elderly in Madiun City  
(Source: Primary data processed by researchers, 2024)

The image above shows the position of items in each quadrant based on the results of the analysis on the elderly. The most items are in quadrant 4, totaling 13, and quadrant 2, totaling 12. Quadrant 3 consists of nine items, while Quadrant 2 has only one item. Quadrant 1 has high expectations but low performance. This shows that performance needs to be a priority for improvement (concentrate here). There is only 1 item in quadrant 2: There are officers or barriers that protect the crossing from motorists (E3), which is an aspect of accessibility.

Quadrant 2 is the quadrant with high expectations and high performance. Items in this quadrant need to maintain their performance (keep up the good work). Based on the results of the analysis, most aspects are in quadrant 2, namely 13 items, which fall into six different aspects. The first aspect is a pleasant and clean environment, which consists of four items and all of these items are in quadrant 2. These items include Madiun City having beautiful parks (A1), Madiun City having shady trees (A2), Madiun City having open areas with a place to rest and socialize (A3), Madiun City has green open spaces and clean public service buildings (A4). Green open space has four items, all of which fall into quadrant 2. This item includes green open space that can be used for walking, gardening, or light exercise (B1), relaxing and socializing in green open space (B2), Green open space that is easily accessible, comfortable, and safe (B3), Green open space that is clean and safe (B4). The aspect of resting places has one item in quadrant 2: resting areas or comfortable public seating in green open spaces (C1). Accessibility has two items in quadrant 2, namely road markings, traffic lights, and crossing signs, which are clear and bright (E1), and the duration of crossing time is sufficient to walk without rushing (E2). The

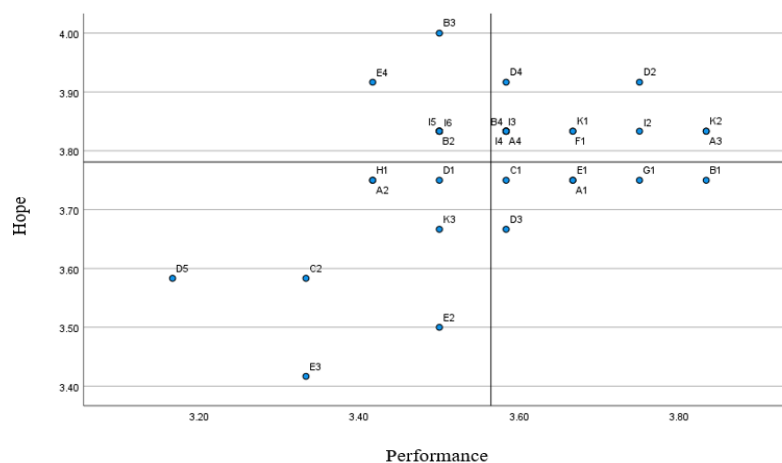


safe environmental aspect has one item in quadrant 2: "Madiun City is a safe place to travel, both from thieves and the threat of other criminal acts." The aspect of a proper public toilet has one item in quadrant 2, namely, "Public toilets in public service buildings are clean (I6).

Quadrant 3 is the quadrant with low expectations and low performance. This quadrant is items that have low priority. There are 12 items from six aspects included in this quadrant. Roads or sidewalks that are elderly friendly, including This quadrant, consisting of three items, namely existing sidewalks that can be used to get to green open spaces or public service buildings (D1), can get up and down the sidewalk easily and without fatigue (D3). There are no obstructive objects in the way. Sidewalks include trees, street vendors, haphazardly parked vehicles, or other objects (D4). The accessibility aspect in this quadrant consists of one item, namely: There are unique warning signs such as "Beware of the Elderly" or "Elderly Friendly Zone" in the road crossing area (E4). The pedestrian path aspect consists of one item in quadrant 3: the pedestrian and cyclist paths are separated by physical barriers from other vehicle paths (H1). There are three items in quadrant 3 of the aspect of adequate public toilets, namely: There are special toilets for disabled people or wheelchair users in green open spaces (I3), There are special toilets for disabled people or wheelchair users in public service buildings (I4), Toilets standard in clean green open spaces (I5). Elderly-friendly customer service has one item in this quadrant. Namely, public service buildings in Madiun City provide separate queues specifically for the elderly (J1). The policy evaluation aspect has three items in this quadrant, which consist of the construction of green open spaces and public service buildings sufficient to meet the needs of the elderly (K3), construction of open spaces and public service buildings able to meet the needs, preferences, and values of the elderly group (K5), Existing open space buildings and public service buildings are in accordance with the aim of elderly-friendly development (K6).

Items in quadrant 4 are items with low expectations and high performance. This item tends to be excessive (overkill). There are nine items from five aspects included in quadrant 4. The first aspect is a place to rest with one item: a rest area or comfortable public seating in public service buildings (C2). Roads or sidewalks that are elderly-friendly consist of two items in quadrant 4, namely, the sidewalks in Madiun City are wide and comfortable. Thus, that they can be used by pedestrians and wheelchair users (D2); Madiun City Road sidewalks do not have holes, and are not slippery (D5). Accessibility consists of facilities, infrastructure, and services around green open spaces and public service buildings that are easy to find and reach (F1). A proper public toilet consists of two items: the location of public toilets in green open spaces that can be found and reached easily (I1) and the location of public toilets in public service buildings that can be found and reached easily (I2). There are three items in policy evaluation namely, the construction of green open spaces and public service buildings is essential to meet the needs and support the welfare of the elderly in Madiun City (K1), the budget used for the construction of green open spaces and public service buildings is quite efficient (K2), the construction of open spaces and public service buildings can encourage equality for the elderly. Thus, that the elderly are not hampered from doing activities and moving places, and can actively participate in social interactions in their environment (K4).

IPA results from government perceptions were also analyzed. The following are the results of mapping government expectations and performance using SPSS.



**Figure 2.** Government Perception of Expectations and Performance of Open Space Facilities and Public Service Buildings for the Elderly in Madiun City.  
Source: Data processed by researchers (2024)



Category 1 is located at the top left. Items in this category need to receive primary attention to be repaired immediately because they have a high level of importance but must be followed by appropriate performance. There are thirteen items from seven aspects included in this category. The first aspect is a pleasant and clean environment with two items. These items include Madiun City having open areas with places to rest and socialize (A3) and Madiun City having open spaces and clean public service buildings (A4). Green open space has one item in this category, namely clean and safe green open space (B4). The third aspect in this category is road or sidewalk footprints that are elderly-friendly with two items, namely, the sidewalks in Madiun City are wide and comfortable, and they can be used by pedestrians and wheelchair users (D2). There are no obstructing objects on the sidewalks, such as trees, street vendors, vehicles parked haphazardly, or other objects (D4).

The next aspect is accessibility, namely facilities, infrastructure, and services around green open spaces and public service buildings that are easy to find and reach (F1). Decent public toilets are also included in this category with three items: the location of public toilets in public service buildings that can be found and reached easily (I2), and special toilets for disabled people or wheelchair users in green open spaces (I3). Special toilets exist for disabled people or wheelchair users in public service buildings (I4). Elderly-friendly consumer services are included in this category. Namely, public service buildings in Madiun City provide separate queues specifically for the elderly (J1). The policy evaluation aspect has three items in this category: the construction of open spaces. Public service buildings are essential to meet the needs and support the welfare of the elderly in Madiun City (K1). The budget for constructing open spaces and public service buildings is quite efficient (K2). Existing open space and public service buildings are in accordance with the aim of elderly-friendly development (K6).

Quadrant 2 is located at the top right, showing items with high importance and high performance. Thus, they are included as a category whose performance needs to be maintained (keep up the good work). This category includes aspects of green open space, safe road crossings, adequate public toilets, and policy evaluation, which totals eight items. Two items are included in the green open space aspect: relaxing and socializing in green open spaces (B2) and green open spaces that are easily accessible, comfortable, and safe (B3). One item included in a safe road crossing is that there are unique warning signs such as "Beware of the Elderly" or "Elderly Friendly Zone" in the road crossing area (E4). Three items are included in a proper public toilet: the location of public toilets in green open spaces that can be found and reached easily (I1), and the fact that public toilets in green open spaces are clean. (I5), and public toilets in public service buildings are clean (I6). The other two items are part of the policy evaluation aspect, namely the construction of open spaces and public service buildings that can encourage equality for the elderly. Thus, that the elderly are not hampered from doing activities and moving around and can actively participate in social interactions in their environment (K4) and the construction of open spaces and public service buildings can meet the needs, preferences, and values of the elderly group (K5).

Category 3 is a less critical aspect with low performance. This aspect is included in the low priority (low priority). There are six aspects, with eight items included in this category. The first aspect is a pleasant and clean environment, with Madiun City having shady trees (A2). The next aspect is a place to rest with rest area items or comfortable public seating in public service buildings (C2). The next aspect is road or sidewalk footprints that are elderly friendly with two items, namely existing sidewalks that can be used to get to green open spaces or public service buildings (D1) and Madiun City Road sidewalks that do not have holes and are not slippery (D5). The fourth aspect is safe road crossings, which consist of sufficient crossing time to walk without rushing (E2), and some officers or barriers protect the crossing from motorists (E3). Aspects of pedestrian and bicycle paths fall into this category. Namely, pedestrian and bicycle paths are separated by physical barriers from other vehicle paths (H1). The final aspect is policy evaluation, which includes building open spaces and public service buildings that are sufficient to meet the needs of the elderly (K3).

Category 4 consists of items with low importance but high performance. Thus, it is referred to as "possibly overkill" or tends to overdo it. There are six aspects, with one item for each category. A pleasant and clean environment consisting of items. Madiun City has a beautiful park (A1). The green open space aspect consists of items that can be used for walking, gardening, or light exercise (B1). The rest area consists of rest area items or comfortable public seating in green open spaces (C1). The aspect of an elderly-friendly road or sidewalk consists of items we can quickly get on and off the sidewalk without fatigue (D3). Aspects of safe road crossings consist of road marking items, traffic lights, and clear and bright crossing signs (E1). The safe environmental aspect consists of Madiun City being a safe place to travel, both from thieves and the threat of other criminal acts (G1).

Based on these results, several items are in the same quadrant based on the perceptions of the government and the elderly. The following table shows these items.

**Table 3.** Items in the Same Quadrant Based on Perceptions of the Elderly and the Government

Item	Quadrant Position
Relax and socialize in green open spaces (B2)	2
Green open space that is easily accessible, comfortable and safe (B3)	2
Existing sidewalks can be used to go to green open spaces or public service buildings (D1)	3
Physical barriers separate pedestrian and cyclist paths from other vehicle paths. (H1)	3
Public toilets in public service buildings are clean. (I6)	2
Relax and socialize in green open spaces (B2)	3

Based on the table above, there are three items in quadrants 2 and 3. Items included in quadrant 2 include Relaxing and socializing in green open spaces (B2), Green open spaces that are easily accessible, comfortable, and safe (B3), and Toilets generally in clean public service buildings (I6). Items included in quadrant 3 are existing sidewalks that can be used to get to green open spaces or public service buildings (D1), separate pedestrian and cyclist paths with physical barriers from other vehicle roads (H1), and the construction of green open spaces and buildings public services are sufficient to meet the needs of the elderly (K3).

The same quadrant shows that the government and the elderly have similar perceptions regarding the importance and performance of certain items. Items in the same quadrant indicate that the government has succeeded in understanding the elderly's expectations and providing adequate performance or even exceeding these expectations. This similarity in perception can be considered positive because it reflects that the development or environmental management efforts are appreciated and deemed adequate by the elderly. The elderly and the government also have different perceptions, based on the IPA analysis results. The items with differences in perception are shown in the table below.

**Table 4.** Items in Different Quadrants Based on Perceptions of the Elderly and the Government

Item	Quadrant Position	
	Elderly	Government
Madiun City has a beautiful park (A1)	2	4
Madiun City has shady trees (A2)	2	3
Green open space that can be used for walking, gardening or light exercise (B1)	2	4
Relax and socialize in green open spaces (B2)	2	1
Green open space that is easily accessible, comfortable and safe (B3)	2	1
Rest area or comfortable public seating in green open space (C1)	2	4
Rest area or comfortable public seating in public service buildings (C2)	4	3
The sidewalks in Madiun City are wide and comfortable so they can be used by pedestrians and wheelchair users (D2)	4	2
I can get on and off sidewalks easily and without fatigue (D3)	3	4
There are no obstructions on the sidewalk, such as trees, street vendors, haphazardly parked vehicles, or other objects (D4)	3	2
Madiun City road sidewalks do not have holes and are not slippery (D5)	4	3
Road markings, traffic lights and crossing signs are clear and bright (E1)	2	4
The duration of the crossing time is sufficient to walk without rushing (E2)	2	3
There are officers, or barriers that protect the crosser from motorists (E3)	1	3
There are special warning signs such as "Beware of the Elderly" or "Elderly Friendly Zone" in the road crossing area (E4)	3	1
Facilities, infrastructure and services around green open spaces and public service buildings are easy to find and reach (F1)	4	2
Madiun City is a safe place to travel, both from thieves and the threat of other criminal acts (G1)	2	4
The location of public toilets in green open spaces can be found and reached easily (I1)	4	1
The location of public toilets in public service buildings can be searched and reached easily (I2)	4	2
There are special toilets for disabled people or wheelchair users in the green open space (I3)	3	2
There are special toilets for disabled people or wheelchair users in public service buildings (I4)	3	2

Public toilet in clean green open space (I5)	3	1
Public toilets in clean public service buildings (I6)	2	1
Public service buildings in Madiun City provide separate queues specifically for the elderly (J1)	3	2
The construction of green open spaces and public service buildings is important to meet the needs and support the welfare of the elderly in Madiun City (K1)	4	2
The budget used for the construction of green open spaces and public service buildings is quite efficient (K2)	4	2
The construction of open spaces and public service buildings can encourage equality for the elderly. Thus, that the elderly are not hindered from doing activities and moving around, and can actively participate in social interactions in their environment (K4)	4	1
The construction of open spaces and public service buildings can meet the needs, preferences and values of the elderly group (K5)	3	1
Existing open space buildings and public service buildings are in accordance with the aim of elderly friendly development (K6)	3	2

The table above shows items for which the elderly and the government have different perceptions, marked by different quadrant positions. There are 29 of these items, which shows that the elderly and the government have many gaps in developing open-space facilities and public service buildings. Based on the elderly's perception, there is one item in quadrant 1, while based on the government's perception, there are eight items in quadrant 1. Based on the results of interviews with older adults, it was found that one main priority was highlighted, namely the presence of officers or barriers that protect pedestrians from motorists on road crossings. This reflects the need for greater attention to senior safety in environmental design. Meanwhile, from the government's perception, eight items are located in quadrant 1, highlighting the importance of green open space, which is also a concern for the elderly. The elderly voiced the need for walking facilities, special seating, and sports facilities, which are crucial for their physical and social well-being. By paying attention to this input, the government can ensure the development of elderly-friendly infrastructure that is more inclusive and positively impacted. Another item considered necessary by the elderly and the government is proper public toilets, especially toilet cleanliness. The government assesses that the cleanliness performance of toilets is still low, but the elderly view the performance as high.

Another item considered low importance by the government and the elderly is that public toilets in public service buildings are clean. (I6), the construction of open spaces and public service buildings can encourage equality for the elderly. Thus, that the elderly are not hampered in carrying out activities and moving places and can actively participate in social interactions in their environment (K4), the construction of open spaces and public service buildings can meet their needs, preferences, and values of the elderly group (K5). This research seeks to determine the achievement of the objectives of providing open space facilities and elderly-friendly public service buildings in Madiun City based on the perceptions of the government and the elderly using an importance-performance analysis approach. This approach can show the level of importance of aspects and their achievability, both from the government's perception and from the perception of the elderly. Importance Performance Analysis shows the government's performance in building open spaces and public service buildings specifically for the elderly to meet the expectations of Madiun City residents, especially elderly residents. Ten aspects have been studied in accordance with WHO categories and evaluation of development policies specifically for the elderly.

### Fun and Clean Environment

Madiun City is currently emphasizing development efforts to increase greenery and equal accessibility for all residents, including the elderly. Findings from the research show that two aspects require significant attention to be improved: open areas with facilities for rest and social interaction, green open space environments, and clean public service facilities. Even though they have a high level of importance, both still have suboptimal performance. On the other hand, the shady tree aspect has low performance, but its level of importance could be higher; thus, it is not a priority.

Open spaces with facilities for resting and socializing can improve the quality of life and sustainability of the elderly (De Haas et al., 2021; Devarajan et al., 2020). Open spaces with chairs or rest areas allow seniors to interact with fellow seniors or other community members. (Chen et al., 2020; Yu et al., 2019). Integrating the availability of open space with elderly welfare programs, including health programs, education, and other social activities, can create an environment that supports a healthy and active lifestyle for the elderly (Chen et al., 2020;

Guo et al., 2019). This open space is not only a physical place for activities but also a place to create positive social experiences for the elderly.

### **Green open space**

The green open space used for walking, gardening, or light exercise shows high performance but is of low importance in Madiun City. This reflects the complex dynamics in preferences and priorities for physical activity among older people in the city. Green open spaces have been carefully designed to support a wide range of physical activities. Available infrastructure, such as organized walking paths, play areas, and open fields, provide seniors with walking, gardening, or light exercise opportunities.

Green open spaces in Madiun City have high performance in relaxing and socializing in green open spaces, as well as green open spaces that are easily accessible, comfortable, and safe. Green open spaces in Madiun City are dynamic for relaxing and social interaction. (Chen et al., 2020; Szychowska & Drygas, 2022). Madiun City's green open spaces demonstrate dedication to effective planning and management with high accessibility, comfort, and security (Azizah et al., 2017; Mulliner et al., 2020). With a focus on cleanliness and safety, green open spaces are a source of happiness, health, and positive social interaction for communities.

### **Resting Place**

The resting place aspect shows low importance in two different contexts. First, in rest areas or comfortable public seating in green open spaces, although the importance is low, the performance remains high, indicating that using green open spaces for resting has met or even exceeded the importance that may have been less than optimistic initially. On the other hand, in rest areas or comfortable public seating in public service buildings, both importance and performance are low, indicating that this aspect requires extra attention and improvement in order to meet the standards expected by the community.

### **Roads or Sidewalks that are Elderly Friendly**

Roads or sidewalks designed for the comfort of the elderly in Madiun City still require improvement and are a priority for the local government. Although some aspects are highly important to society, their current performance shows a low level. Wide and comfortable sidewalks, allowing use by pedestrians and wheelchair users, have a high level of importance but are still not entirely fulfilled. (Guo et al., 2019; Indradjati & Rahayu, 2021).

Sidewalks that are free from obstructions in Madiun City play an important role in creating a safe, inclusive, and enjoyable urban environment for the entire community. However, the analysis results show that the need for sidewalks free from trees, street vendors, haphazardly parked vehicles, or other obstacles has not been fully achieved, and its performance is currently still low. The presence of obstructions on sidewalks is not only a physical issue but also reflects aspects of safety and accessibility. By removing barriers, sidewalks become more easily accessible to all residents, including seniors and those with limited mobility. (Anderson-Bill et al., 2011; He et al., 2020)

### **Safe Road Crossing**

Safe road crossings are measured based on four aspects. Unique warning signs for the elderly in road crossing areas reflect the public's interest in extra protection and awareness of the elderly group. Exemplary implementation with clear and bright warning signs shows that the Madiun City government has successfully created a safe and friendly environment for the elderly when crossing the road. The second and third aspects, namely the presence of officers or barriers that protect crossers from drivers and sufficient duration of crossing time, are not a priority for improvement. This is because public interest in these two aspects is low. The low importance placed on road markings and crossing signs reflects the perception that these are adequate standards. However, high performance in this aspect shows that despite low interest, the Madiun City government has successfully maintained high security at road crossings with exemplary implementation.

### **Accessibility**

The accessibility aspect, measured based on the availability of facilities, infrastructure, and services around green open spaces and public service buildings that are easy to find and reach, describes a situation in Madiun City where the public's high interest in reasonable access is not entirely fulfilled. Low performance in this aspect indicates that the implementation and availability of facilities have yet to reach the standards expected by the community. Improvements in accessibility can have a positive impact on people's daily lives, especially for those who need better access to public facilities and services. (Chan et al., 2021; Guo et al., 2019)

### **Safe Environment**

The safe environment in Madiun City shows high performance, with indications that this city is considered a safe place to travel, free from the threat of theft and other criminal acts. Despite its high performance, this aspect

is of low importance to society, indicating that the level of security that has been achieved exceeds society's needs.

### **Pedestrian and Bicycle Paths**

Separate lanes for pedestrians and cyclists in Madiun City show low performance, indicating that their implementation does not meet expected standards. This may include imperfections in the trail's design, implementation, or maintenance. The low level of public interest in this separate pathway suggests that society may not place a high priority on this aspect.

### **Decent Public Toilets**

Public toilets in Madiun City show the public's high importance on cleanliness, accessibility, and comfort. The evaluation results show three aspects with high importance and performance, indicating the attention paid to accessibility and comfort. However, three other aspects of low performance must be improved, including ease of access and special toilets for disabled people or wheelchair users. Improvements in design, sustainability, and maintenance can improve the performance and inclusiveness of these facilities, creating a more comfortable and inclusive environment for all residents, including seniors with limited mobility. (Flores et al., 2019; Guo et al., 2019).

### **Elderly Friendly Customer Service**

The analysis results show that aspects of Elderly Friendly Customer Service in Madiun City, primarily related to the provision of separate queues specifically for the elderly in public service buildings, have a high level of interest from the public. However, low performance indicates that, to date, no separate queue has explicitly been provided to serve the elderly. (Murthy et al., 2021; Podgórnjak-Krzykacz et al., 2020). The mismatch between high importance and low performance shows the need for improvements and adjustments in improving consumer services that are more inclusive and friendly to the elderly in Madiun City. By accommodating the unique needs of seniors, Madiun City can improve the quality of service and provide a better experience for its entire community.

### **Policy Evaluation**

Researchers analyzed the level of importance and performance in developing green open spaces and public service building facilities as a whole. The importance and performance of each aspect in policy evaluation have varying levels. The high level of interest and fulfillment of high performance in the development aspect of open spaces and public service buildings can encourage equality for the elderly, showing the development's success in positively impacting the elderly group in Madiun City as a whole. This development is expected to create an environment that supports the well-being of the elderly by eliminating obstacles that might hinder their activities and mobility. Building open spaces and public service buildings that can meet the needs, preferences, and values of the elderly group is also highly important and performs well. High performance indicates that the development effectively accommodates the practical needs, design preferences, and values held by the elderly. In other words, this development holistically understands and responds to the diverse needs and preferences of the elderly group.

Three aspects of policy evaluation need to be prioritized for improvement. Policies oriented toward the needs and welfare of the elderly in Madiun City are one highly important but low-performing aspect. The budget used for the construction of open spaces and public service buildings is quite efficient and is shown to be highly important, but its performance is low. Improvements in the budget used to construct open spaces and public service buildings are important because budget efficiency reflects sustainability and optimization of development investment results. The third aspect of policy evaluation that needs to be improved because its importance is high but its performance is low is that open space and public service buildings in the City are not fully in line with the aim of elderly-friendly development. This also aims to ensure that the resources invested in development really have a maximum positive impact on the welfare of the elderly.

### **Conclusions**

Based on the analysis results, six items have the same quadrant position between the elderly and the government. These items are in quadrant 2, which has high importance and high performance, and quadrant 3, which has low importance and low performance. 29 items differ from the views of the elderly and the government; apart from that, one item, which is a high priority for the elderly, is missing from the government's perception. This shows that there is a gap regarding things that are considered necessary by the elderly and the government.

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