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The Impact of Flyer with Infographics on Public Awareness and Interest to Transportation Project

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Abstract

Informing citizens at an early stage of the planning process is very important so as to increase awareness and interest to the transportation project. It helps us to increase meeting participants and activate discussion. This study investigates the effectiveness of infographics in public notice documents through randomized controlled trial. Two groups of people received flyer with different design, which is ordinary design and infographic design. The answers to the questionnaire of the second survey were compared with the first survey. Result showed that infographics flyer can increase awareness more than ordinary flyer. Statistical t-tests confirmed the difference between two designs. However, neither infographics flyer nor ordinary flyer can increase interest to the project. Because there are many people who have already interested in the project, the difference is not significant.

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1. Introduction

Public involvement is fundamental in planning process of transportation infrastructure. It is improving in many projects, however many citizens still unconcern with the issues and most of them do not understand the purpose or content of proposed plans. Informing citizens at an early stage of the public involvement process is very important.

Flyer inserting in newspapers or distributing on information rack is one of the most popular ways for public notification at the early stage of the planning process in Japan. Such flyers are periodically released, for example once every few months, and contain information related to project description, planning processes and timelines, and public meeting or other events.

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There are some problems when using flyers as the way for public notification. One is the way of flyer delivery. In Japan, most newspapers are delivered to homes, so planning authorities assume that residents will read the inserted advertisements if they subscribe to a newspaper. However, many people just skim the inserted flyers before throwing them away; only those that are attractive and people are clearly interested in will be read.

Another problem is that many inserted flyers contain too much information. Due to budget constraints, planning authorities cannot afford to publish many issues during the planning process. Thus, writers are requested to include as much information as possible within a limited number of issues. However, this leads to that less graphics are used and the layouts are shown by small font sizes and narrow space between lines, further increasing the impression of difficult content.

Therefore, this study aims to investigate whether flyers including infographics better inform citizens. For this purpose, an experiment is made through applying randomized controlled trial, which is a type of scientific experiment which aims to reduce bias when testing a new treatment, to test whether such flyers with infographics might attract more readers.

Infographics are graphic representations of data intended to more clearly present information. Infographics can improve cognition by utilizing graphics that enhance the human visual system's ability to see patterns and trends (see Wikipedia, 2016). By using infographics to improve flyer design, planning authorities can better present information, making it more accessible to its intended audience. The infographic can be a powerful tool for conveying information to the people with limited language proficient (e.g. non-native citizens). It uses fewer words and more figures to make people understand the contents. Thus, agencies use infographic for not excessively relying on native language sentences.

Studies about infographics are increasing in many fields of research. Harrison et al. (2015) investigated how quickly aesthetic impressions are formed, and what it is that makes an infographic appealing by analyzing 1,278 participants' ratings on appeal after seeing infographics for 500ms. They concluded that the first impression is largely based on colorfulness and visual complexity and age, gender, and education level influence the preferred level of colorfulness and complexity. Delil (2013) discussed infographic animation videos rather than printed versions of infographics for transferring data to the audience quickly and effectively. Majooni et al. (2017) claimed that the comprehension from the zigzag form of the layout was higher with a less imposed cognitive load through eye-tracking data analysis. Siricharoen (2015) explained how infographic help promoting better communication, especially about the health and well-being problems with the Maori in New Zealand.

There are some transportation practices communicating with stakeholders. Gutschow (2017) presented the prize-winning infographic which highlights potential health issues for individuals living near busy roadways. It is fun to see a lot of design examples in the area of transportation (see Future Cape Town, 2017, and Institute for Transportation and Development Policy, 2017). There is no research showing the impact of infographics comparing to other ordinary design based on the viewpoint of public involvement, except our previous researches (see Terabe et al. 2013, and Tomiyama et al. 2017).

Comparing to our previous researches, this study focused on whether flyers including infographics affect better to general public. Although our previous experiments were carried out in laboratory, this study asked questionnaire to citizens.

2. Experimental procedure

2.1. Creating a flyer with ordinary design

A single-page A4-size (210 mm × 297mm) flyer which is similar to those distributed to the public is made as newspaper inserts. Information in the flyer included the project name, the overview of the project with map and renderings, the necessity of the project, and the person to contact for further information. In order to make a flyer with ordinary design as much as possible, the website of existing project are referred for making the flyer look more realistic to citizens. The project is elevating a station with grade-separated crossings of commuter rail and streets. Fig. 1 shows the flyer in the original design.



Fig. 1. Flyer with ordinary design.

2.2. Creating a flyer with infographic design

Next, the flyer with infographics (IG flyer hereafter) is created. The procedure for creating infographics was shown as follows.

- 1) Information in the original flyer is classified into six categories: project name, overview of the project, map, rendering, necessity of the project, and contact information.
 - 2) The amount of information which is presented to allow presentation of the infographic is reduced in a limited space. This is because if the flyer presents too much information, the infographic will not convey a strong message to readers.
 - 3) When writing sentences and figures, the following principles are applied:
 - Use only highly pertinent information
 - Cite figures
 - Use short sentences
 - Use few colours
 - 4) After completing a rough sketch, a professional designer lay out final wordings and figures.
- Fig. 2 shows the completed experimental IG flyer.



Fig. 2. Flyer with infographic.

2.3. Survey and experiment

Two waves of questionnaire survey were completed by 188 householders in Kasukabe, a suburb of the Tokyo metropolitan area. The Kasukabe city had an estimated population of 236,594 in 2016 and a population density of 3,510 people per km². The appropriate sample size, 384 samples, are determined by statistics under the given population size and setting margin of error (confidence interval) as +/- 5%, and confidence level as 95%. Assuming that the collection rate or response rate is 15%, we decided to distribute 2,567 questionnaires in the first survey. The survey overview is described in Table 1.

Table 1. Survey Overview.

Item	First Survey	Flyer Distribution	Second Survey
Period	Nov.11-15, 2016	Jan. 2-4, 2017	Jan. 6, 2017
Coverage area	7 districts	3 districts	
Distribution method	Delivery to each household		Send by mail
Collection method	Mail-back	---	Mail-back
No. distributed	2,567	102	330
No. collected	330	---	188
Collection rate	12.9 %	---	57.0 %

Fifty to sixty copies of the questionnaire were distributed randomly and widely at each neighbourhood so as to avoid concentrating on certain blocks. Number of distribution was depends on population statistics on each neighbourhood. A total of 2,567 questionnaires were distributed and 330 were collected (collection rate of 12.9%). The respondents were 65% male and 35% female; many belonged to the 60- to 70-year-old age bracket. The respondents comprised of retirees (41%), fulltime company employees (25%), part-time company employees (13%), homemakers (8%), or others; more than half of whom drive car regularly (60%) and almost same portion use train regularly (57%). These characteristics of the respondents are amenable to further study, because they are not biased toward the official demographic census.

The experiment was conducted in January 2017. Three districts were selected as experimental sites because of their variety of proximity to the project, to improve the randomness of our experimental design. Two kinds of flyers, with ordinary and infographic design, were distributed to each household, which responded to the first survey in three districts. One third (1/3) of the respondents received a flyer with ordinary design, and another one third (1/3) received an IG flyer, and the last one third (1/3) received nothing, which means no flyer was delivered.

Soon after the flyer distribution, the questionnaire of second survey was sent by mail to 330 respondents who had returned the first questionnaire. There were 188 questionnaires collected (collection rate of 57.0%). Since all respondents reported us their postal addresses at the first survey, we can distinguish who received which design of flyer. During the period of the first and second survey, no special event, which may cause the other effect than our flyer distribution, were happened. The experiment was randomized because the other condition around survey respondents was same.

2.4. Analysis method

The answers to the questions of the second survey were compared with the first survey. Although there were many questions in each questionnaire, we focused on two important questions in this study;

Q1: Have you ever seen the project before? (Awareness)

Q2: Do you have any interest to the project? (Interest)

These two core questions draw fundamental assessment of earlier public involvement process, which needs more awareness and interest from general public. And the differences in answers between before and after the flyer distribution reveal fundamental impact of flyers.

Respondents were asked to answer by choosing along a four-point scale for each questions from “strongly disagree” (= 1) to “strongly agree” (= 4). The share and average points of answers were compared with each other.

3. Results and discussions

3.1. Awareness

The answers to the Q1 are shown in Fig. 3. Share of answer as “strongly aware of the project” and “aware of the project” increased after the distribution of flyers in both designs of ordinary and infographic. This means that the flyer can increase people’s awareness. IG flyer increased 29.2 points after the distribution, which is larger than ordinary flyer (15.6 points increase). Difference of average score of answers were 0.7 and it was statistically significant (p-value = 0.016). Thus, IG flyer can increase awareness more than ordinary flyer.

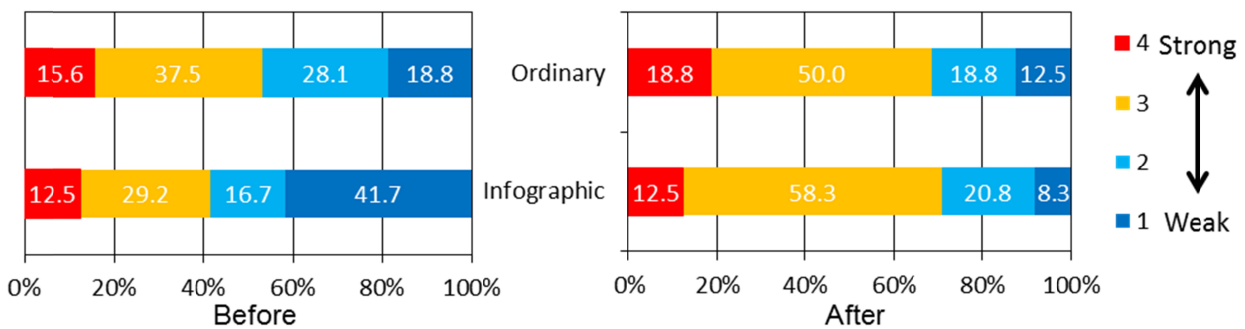


Fig. 3. Awareness before / after the flyer distribution.

3.2. Interest

The answers to the Q2 are shown in Fig. 4. Share of answer as “strongly interested in the project” and “interested in the project” increased after the distribution of ordinary flyers (6.2 points), whereas IG flyer could not increase (0 point). Difference of average score of answers was 0.0 for IG flyer and 0.3 for ordinary flyer, which are not statistically significant. Thus, neither IG flyer nor ordinary flyer can increase interest to the project.

Why IG flyer cannot impact to the interest in this experiment? Because there are many people who have already interested in the project since before, the growth is small. For those who have an interest in this project, the IG flyer does not contribute to increase interest because there is little information on that. It is effective for low interest project which have enough opportunity.

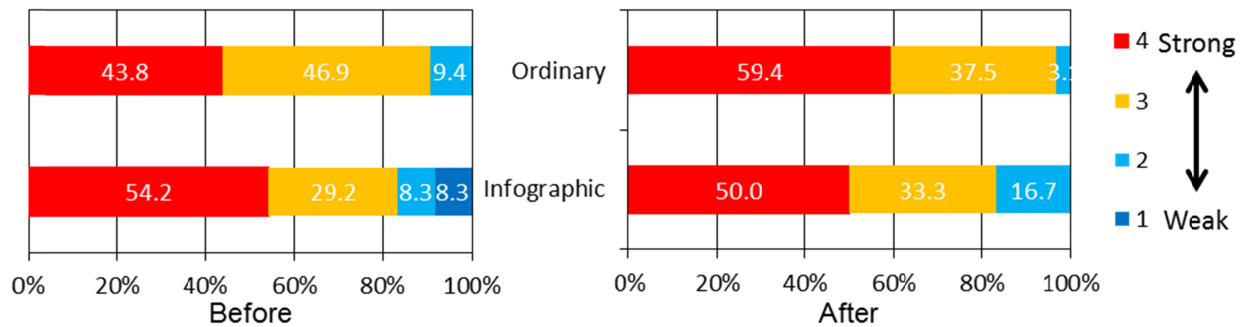


Fig. 4. Interest before / after the flyer distribution.

4. Conclusion

Planning authorities should make efforts toward increasing awareness and attracting interest in transportation infrastructure projects. This study focused on flyers as one tool for public involvement. We applied infographics to a flyer design with the goal of better attracting the eye of viewers.

Although the sample size in this experiment is small due to the panel survey and should be expanded more, the important fact is derived from research questions; whether flyer with infographics impact on public awareness and interest to transportation project. Based on the comparison between before and after the flyer distribution, increasing interesting and legible design through using infographics in flyer can improve people’s awareness. The infographic, however, cannot contribute toward getting more interest from people. It does not admit of increasing interest of people who have already interested in the project.

There are a few issues to be discussed in the future works. One of them is how infographic works on less interested project. Case study in this research is about railway station improvement, which has been already attracted some railway commuters. It needs to know which project the IG flyer was more effective and what level readers increase their interests. Except for studying other type of projects, it is also important to know how IG flyer is favorably impressed, and as a result of these improvements, how many attendances increase at a public meeting. The final goal is better decision-making after enough public participation throughout the planning process. The IG flyer can be an important driver to this goal, however, it is not solely attributed to it.

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