



## **IDENTIFYING END USERS' EXPECTATIONS FROM PUBLIC PRIVATE PARTNERSHIPS**

Kondapalli, Sathyasheel<sup>1</sup> and Sharma Deepak<sup>2,3</sup>

<sup>1</sup> Graduate Research Assistant, Department of Civil and Environmental Engineering, California State University Fullerton, US

<sup>2</sup> Assistant Professor, Department of Civil and Environmental Engineering, California State University Fullerton, US

<sup>3</sup> [dsharma@fullerton.edu](mailto:dsharma@fullerton.edu)

### **ABSTRACT**

Public Private Partnerships (PPPs) have been used successfully in a variety of projects in several countries. As per World Bank, the use of infrastructure PPPs has been gradually increasing throughout the world. Because PPPs are investment intensive government agencies, they put significant effort to ensure PPPs do not fail and harness all the expected benefits. In the past, some PPP projects failed to attract sufficient end-users, which lead to a partial achievement of goals. One of the probable reasons for such a failure is the difference between the public sector and people's expectations from PPP projects. Agencies have used traditional statistical methods to analyze and interpret end user's concerns, but such methods cannot extract all the necessary information. The limited understanding of end-users' expectations could be one of the reasons that the agencies' are not able to design projects that people would readily accept.

Understanding peoples' concerns will greatly help the agencies to plan for PPP success. If people's opinion is captured accurately, the government can focus on addressing those concerns. This will also reduce people's skepticism and increase confidence in public agencies' decision-making capabilities. This research presents the study of extracting valuable information for PPP projects using Kano Analysis (KA). Traditionally, KA has been used in the manufacturing industry for product design, but through this work, we have extended its application to PPPs. Results show that KA can be conveniently used for selecting the best project delivery option while meeting people's expectations. KA results will also enable agencies to strategically design outreach programs to educate people wherever needed.

### **1. INTRODUCTION**

Public Private Partnerships (PPPs) have been used in many countries successfully. These are used on a variety of projects, such as airports, highways, seaports, rails, prisons, hospitals, and water treatment plants. As per World Bank, \$69.9 B was invested on transportation PPP projects throughout the world (Kasper and Saha, 2015). This is a 53% increase from the past 5-year average, and it is 86% above the past 10-year average. The PPPs have enabled the public agencies to complete several projects that would not have completed without higher levels of private sector involvement. While PPPs can help government agencies to meet their goals, one cannot guarantee that all PPPs would succeed.

PPPs are complex project delivery methods that require meticulous assessment and decision making. Persistent attempts have been made by researchers to ensure that the best PPP type is selected. A review of the literature indicates that the research effort is mainly focused towards issues, such as investment environment, procurement, economics viability, financial viability, risk management,

governance issue, and integration research, (Ke et al., 2010) amongst a few others, sidelining the issues from end user's involvement (Ng et al., 2012 b) and expectations. In reality, the end-users collectively form a major stakeholder group having a direct influence on project success. The current PPP feasibility and approval methods will be greatly enhanced if we can determine what people want, what are their expectations and measure their influence on the overall project. Although the government agencies have outreach programs to identify and address community concerns (NCHRP, 2010), there exists a major gap between capturing people's expectations and agencies' decisions.

Understanding end user's expectations can avoid several issues arising from discontentment amongst the end-users from misaligned project expectations. This research is focused on extracting the maximum amount of information from surveys to enable agencies to understand people's expectations using Kano Analysis (KA). Traditionally, KA has been used in the manufacturing industry for product design. It allows for the collection and interpretation of people's expectations from a new perspective, but this research shows how KA can be conveniently used for selecting the best project delivery option to meet people's expectations. KA results will also enable agencies to strategically design outreach programs to educate people wherever needed.

## **2. LITERATURE REVIEW**

A review of the literature shows that addressing people's preferences (or concerns) is a major critical success factor for PPPs. Dixon et al. (2005) found that consultation with end-users ensures successful PPP delivery because their needs get properly reflected on in a completed project. Jacobson and Choi (2008) found that using community outreach and formally involving end-users reduces likely oppositions to PPPs. Such results imply that satisfying people's expectations can improve chances of PPP success. However, agencies seem to be unaware of this fact, and there is a need for researchers to help agencies in understanding people's preferences. Ng et al. (2012 a) found that a significant difference between the public sector and general public exists when it comes to defining PPP success. Several factors that were important to the public sector were not so important to the end-users, indicating that the public sector's and people's expectations from PPPs are not aligned. Similarly, Majamaa et al. (2008) reported that the PPP evaluation process fails to integrate end user's perspective. Although Majamaa et al. (2008) were reporting their findings for PPPs in real estate industry, we believe that similar failures also take place in infrastructure PPPs. If the end user's preferences are not met, they could feel betrayed by the agencies. They could lose trust in government initiatives and could lead to PPP failures (Soomro and Zhang, 2015).

The General Accountability Office (GAO) in the US asked agencies to conduct a rigorous upfront analysis to protect public interests (GAO, 2008). Research has been conducted regularly over the past decade to improve PPP projects. This includes, but is not limited to, proper feasibility analysis (Cui et al., 2010 and Power et al, 2009), optimal financial structuring (Sharma, 2010), best concessionaire selection (Zhang, 2009), meaningful comparison of PPP projects (McCowan and Mohamed, 2007), allocation of guarantees (Brandao and Saraiva, 2008), and risk sharing (Chan et al, 2008). Prominent agencies have developed guidelines and toolkits (PPP Canada, 2014; PPIAF, 2009 and FHWA, 2012) for smooth PPP project delivery. All such works have been extensively focused towards areas other than people's expectations. Only a few researchers have focused on end-users expectations in PPPs.

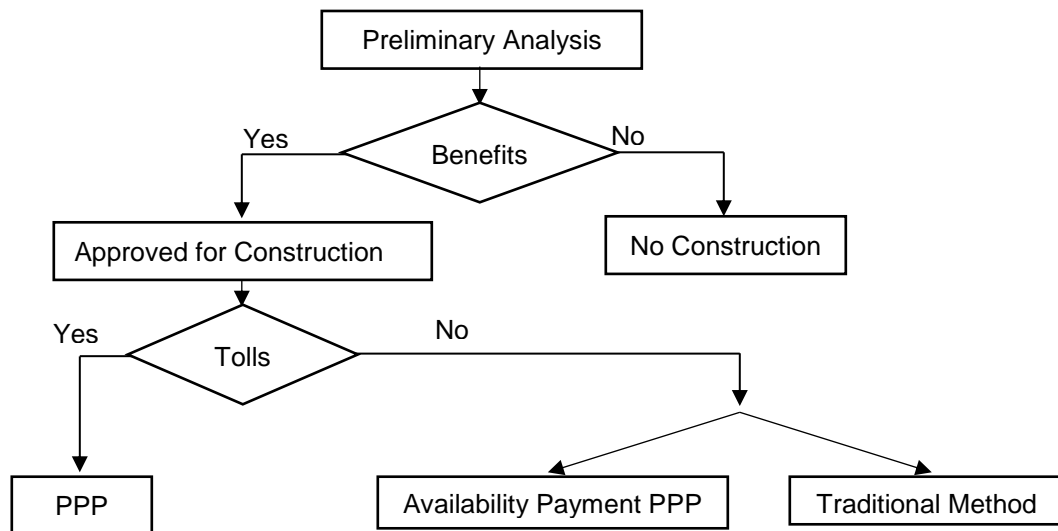
Ng et al. (2012 b) have addressed the issue of capturing people's concerns during different stages of a PPP project. The authors present a process that extends PPPs to Public Private People Partnership (P4). The P4 process framework presented in their paper includes bottom-up participative strategies against the traditional decide-announce- defend approach. Similarly, Majamaa et al. (2008) developed a customer-oriented model for PPP evaluation and Dolio (2008) introduced a framework that could sustain PPP projects by satisfying stakeholder demands. Other researchers have also emphasized the importance of considering end-users' perspective (Rohman, 2015). These research works imply that PPP outcomes can be improved if end-user expectations are understood and PPPs contracts are tailored to fit people's expectation. However, it is difficult to understand peoples' expectations.

This paper uses Kano Analysis (KA) for collecting, analyzing, and interpreting end-user expectations. The information gained from this analysis will enable us to understand people's expectations and also pursue

PPPs with more support from end-users. The information can also be used for strategically developing outreach programs to achieve alignment of objectives between the end-users and the public agencies.

### 3. RESEARCH MOTIVATION

Typically an infrastructure project goes through several phases. These phases are shown in the following flow chart (Figure 1). The process is such that people’s input could help significantly. However, the data obtained by the agencies through public meetings and surveys are not analyzed to extract information which would interpret the actual sentiments of the public. There is no doubt the agencies are carefully analyzing the data as it was done in NCHRP Synthesis 377 report, but the primary mode of analysis is a basic descriptive statistical analysis (Appendix B of NCHRP Synthesis 377), which is a partial extraction of information. The information analysis at various stages of the project will help the agencies in different ways as discussed below.



**Figure 1: Various Stages of a Proposed Project Influenced By People’s Inputs**

During the process, input from the public could help decision makers to select the most efficient PPP route. Let us assume that the project is approved for construction and the agencies must select the best project delivery option. Let us also assume that the region does not have a tolling culture. The lack of a tolling culture would indicate that the toll collection on the proposed project would face people’s resistance. If through a data analysis we realize that a toll culture does not exist, it implies that agencies can still procure the project through a PPP, but the revenue collection method has to be indirect, which indicates an availability payment mode of revenue management. Alternatively, as shown in Figure 1, if the toll road culture does exist, it could indicate easy acceptance to tolled PPPs and the availability payment model. The input from people could help agencies decide the most efficient PPP type for the project, such as Design Build Finance (DBF) or Design Build Finance Operate Maintain (DBFOM) or any other form of PPP.

Identifying peoples’ concerns, in addition to adequate information extraction, will greatly help the agencies plan for PPP success. However, the current methods of analyses, which are limited to descriptive statistics, are inadequate to extract the required information. We believe that the data analysis and correct extraction of peoples’ sentiments for PPPs is crucial for success. If people’s opinion on the project can be captured accurately, the government can focus on giving priority to those concerns. This could also reduce skepticism in people and increase confidence in public agencies’ decision making capability.

The main limitation with surveys is that it has to be collected using numerical scales or binary answers, such as yes/no. These options could lead to confusion when responding, and the interpretation can vary from person to person. Let us assume that the input for a question must be given on a ordinal scale from 1-5. A respondent’s definition of 3/5 can vary from other respondent’s 3/5 because the assumptions they

make can be different from each other. A traditional survey tries to capture the priority given by the respondents about a concern but is inefficient in capturing the emotion of the respondent. A considerable amount of time is also spent trying to interpret the question and give an appropriate priority level on an ordinal scale. As per Matzler et al., the current survey methods enable us to see only in one dimension, which means that higher quality gives higher customer rating. However, the type of expectation that defines quality is not sought and captured in the responses (Matzler et al. 1996). Conversely, Kano Analysis enables us to understand the respondents' emotions towards specific concern which are discussed in the following section.

#### 4. WHAT IS KANO ANALYSIS (KA)?

KA is a method for measuring customer satisfaction (Mikulic, 2007, Wu and Wang 2012). It has been used successfully to understand customers' requirements and modify the designs during its development phase (Berger et al 1993). It uses a strategically formed set of questions to understand the customer's requirement thoroughly. KA differs from other types of data analysis as it segregates people's opinion into realistic categories. The traditional analysis gives a weighted outcome but KA gives clearly segregated outcomes within a spectrum of very desirable to a non-desirable end-user expectation. The KA outcome can help the decision makers understand the most critical factors that could influence a product's (or project's) success. Similarly, KA can be used on public construction projects to obtain peoples' opinion about a planned project.

**Table 1: Classification of User Responses As Per Kano Analysis (Berger, 1993)**

Kano model mapping	Dysfunctional				
	I like it/ Comfortable/ I agree	It must be/ Very comfortable/ I strongly agree	Neutral	I can live with it/ I don't care	I dislike it/ I disagree/ Not comfortable
I like it/ Comfortable/ I agree	Q	A	A	A	O
It must be/ Very comfortable/ I strongly agree	R	I	I	I	M
Neutral	R	I	I	I	M
I can live with it/ I don't care	R	I	I	I	M
I dislike it/ I disagree/ Not comfortable	R	R	R	I	Q

As per Kano analysis, each question must be asked in two ways Functional and Dysfunctional. Functional being what the user feels if the said factor is available in the end project. Dysfunctional being what the user feels if the said factor is not available in the end project. Each individual answer is classified into the following categories are explained below (adopted from Berger, 1993)

- Attractive (A): If a factor falls into this category it means that the user would be happy if it is available but wouldn't be disappointed if it is unavailable.
- One-dimensional (O): A direct relation exists between user satisfaction and the availability of factor. So, if a factor falls into this category it is of the highest importance to make it available in the end product.
- Must be (M): These are the basic requirements and cannot be neglected.
- Indifferent (I): If a factor falls into this category it means that it has no impact on user satisfaction. The availability or absence wouldn't make a difference on customer satisfaction.
- Reverse (R): If a factor falls into this category it means that it is reducing the customer satisfaction and must be removed.

- Questionable (Q): These are questionable results and cannot be used for assessment.

The above classification of answers is done using the Table 1. All the responses are categorized in Kano categories which can be easily obtained by finding the intersecting cell from the rows (Selecting the response of the Functional question) and the column (Selecting the response of the dysfunctional question) in Table 1. Further details are provided in section 5.1.1.

KA takes a unique approach while building the questionnaire. Attempts are made to echo the most probable emotions a person could have regarding a concern. The concern takes the form of a question and the emotion becomes one of the options. However, in traditional survey instruments, the questions and the responses are developed to match with standard questionnaire survey designs. This could make it difficult for respondent's answer it to match their thoughts. For example, A question such as "Do you support tolls?" on a scale of 1 to 5 (1 being a strong no, while 5 being a strong yes) will leave several respondents confused. For one respondent a selection of 4 could mean very different from another respondent's selection of 4. However, both responses will be given the same weight while analyzing the results. Contrary to this, KA is capable of reducing such errors because the options are precisely defining the emotions that will be more realistic than the standard ordinal rankings. In addition, Kano analysis requires asking 'functional' and 'dysfunctional' questions which eventually enables us to identify questionable responses. The questionable responses are the conflicting responses given by respondents. Too many questionable responses indicate an ambiguous set of question while limited questionable responses indicate respondents' personal ambiguity. All the responses falling in 'questionable' category are excluded from the analysis making more accurate. A hypothetical example is presented here for demonstrating this method.

## 5. HYPOTHETICAL EXAMPLE

This section presents a hypothetical scenario to demonstrate the use and application of KA. Let us assume that the preliminary analysis approves a project for construction and the agencies are concerned about selecting a project delivery system. The agencies must procure the project delivery system that best meets people's expectation. But the traditional descriptive statistical analysis would only provide limited information which does not help much in selecting the most desirable project delivery system.

### 5.1 The Analysis Steps

The analysis includes developing a questionnaire, collecting responses, analyzing and inferring results as described below.

#### 5.1.1 Questionnaire Development

A questionnaire should be prepared after selecting several factors which could play a pivotal role in peoples' PPP acceptance. In this research work, five concerns have been selected.

- *Concern 1: Opinion on Toll Payments*

Public's opinion on toll roads could vary drastically by demography and could play an important role during the throughout the lifecycle of a project. People of certain demography might believe that since they are paying taxes the government must take care of the infrastructure development. On the other hand, others could be of the opinion that the tolls must not be collected by private contractors in the form of tolls. So analyzing people's opinion on this aspect is important to plan for future projects and to shape the PPPs accordingly. If there is considerable resistance from people regarding tolls, it would be advisable to look for an alternative such as PPP through availability payments (as shown in Figure 1) or the traditional approach. Using KA we can understand people's opinion regarding tolls and requires us to ask questions in two ways – Functional and Dysfunctional.

The Functional Question:

In this question, we ask the public about their opinion on toll roads while quantifying the advantages of a toll road. This can be achieved if we ask the second question as below:

Q1) Would you agree to pay tolls if your commute time is reduced by 30%?

I strongly agree     I agree     I am neutral     I don't care     I disagree

The Dysfunctional Question:

Through the dysfunctional question, our intention is to find out the public's opinion if there are no toll roads. This can be achieved if we ask the second question as below:

Q2) Do you agree that traveling on toll roads are not worth the cost?

I strongly agree     I agree     I am neutral     I don't care     I disagree

If a respondent answer for Q1 is 'I disagree' and for Q2 is 'I strongly agree', as per Table 1 this answer would be classified as 'R' – Reverse (shown highlighted in Table 1). This means that the user is not in favor of toll payment. Similarly, we can have other concerns coded for KA analysis by developing functional and dysfunctional questions. Table 2 has a set of questions that were used in this research.

- *Concern 2: Collection of Tolls*

The entity collecting the tolls could be a concern for many. It is assumed in this research that people could be supportive about public agencies collecting tolls but would not be tolerant if private agencies are involved in toll collection. In this research, we developed the functional question asking about private entity collecting tolls and the dysfunctional question as public entity collecting tolls.

- *Concern 3: Equality*

The collection of tolls can create a conflict about equality as not all people can afford to pay tolls on a daily basis. To find the opinion of the people on this concern we have asked the functional question asking whether the collection of tolls encourages inequality. The dysfunctional question was asked whether toll collection is reasonable and does not create a conflict about inequality.

**Table 2: Questions Used for Kano Application to PPPs**

	Questions Designed	Concern
1	Would you agree to pay tolls if your commute time is reduced by 30%? *	Toll Payment Acceptance
2	Do you agree that traveling on toll roads are not worth the cost? *	
3	Do you believe that the collection of tolls conflicts the concept of equality as not all people can afford toll payments daily? *	Social Equality
4	Do you believe that toll collection is reasonable as it enables faster travel? *	
5	How comfortable are you if a private agency collects tolls? †	Private Sector Collecting Tolls
6	Would you agree to pay tolls if the government collects it? *	
7	When a private company maintains & operates the roads, I am.... †	Who Operates and Maintains
8	Government agencies must maintain & operate roads. Personally I... ‡	
9	How comfortable are you if government agencies allow private companies to combine construction with financing, designs, etc. Implying higher private involvement? †	Higher level of private sector Participation
10	Government agencies must retain the majority of responsibilities (financing, operating, maintaining, designing) of a project. ‡	

\* Answer choices are A) I strongly agree B) I agree C) I am neutral D) I don't care E) I disagree

† Answer choices are A) Very Comfortable B) Comfortable C) I am neutral D) I don't care E) Not Comfortable

‡ Answer choices are A) I like it that way B) It must be that way C) I am neutral D) I don't care E) I don't like it that way

- *Concern 4: Maintenance of Roads*

People's view on who should maintain the road can also influence if the project can allow operating and maintaining responsibilities to be transferred to the private sector. Questions 7 and 8 in Table 2 are designed to capture this concern.

- *Concern 5: Higher Private Sector Participation*

Allocation of higher responsibilities to private entities could result in dissatisfaction from end users. Knowing their opinion prior to taking decision will help in taking the correct decision.

### 5.1.2 Collecting People’s Opinion

The above questionnaire can be used by agencies to collect people’s views. For this research project, we created a demographic profile of respondents with varying levels of support to various aspects. We used Monte Carlo Simulation using MS Excel and developed people’s responses.

**Table 3 Assumed Proportions of People’s Opinions**

Question	Expected Population Proportions					Concerns
	A	B	C	D	E	
1	0.1	0.2	0.05	0.15	0.5	About Toll Culture
2	0.4	0.25	0.05	0.10	0.2	
3	0.5	0.1	0.2	0.05	0.15	About Equality
4	0.2	0.15	0.15	0.1	0.4	
5	0.15	0.15	0.15	0.05	0.5	Private Sector Collecting Tolls
6	0.2	0.6	0.1	0.05	0.05	
7	0.35	0.25	0.05	0.05	0.3	Who does Operation and Maintenance
8	0.3	0.2	0.05	0.03	0.42	
9	0.5	0.1	0.05	0.05	0.3	Higher Private Sector Involvement
10	0.1	0.6	0.05	0.05	0.2	

According to Table 3 people in a region may or may not have a concern. For this research, we allocated different proportions to the five concerns discussed above. The difference in proportions allows for creating a spectrum of responses from the assumed respondents. For example for question 1, only 10% respondents are expected to select “I strongly Agree” (by selecting option A) but for question 3, 50% people are expected to select the same option. Excel’s RAND function was used to develop random numbers and these were used to in conjunction with the above proportions to segregate and count the responses in each category between A to E.

### 5.1.3 Data Processing

Monte Carlo Simulation gave us the response rates shown in Table 4.

**Table 4: Simulated Response Rates**

Question	People's responses					Total
	A	B	C	D	E	
1	1019	1981	513	1479	5008	10000
2	3979	2504	494	1001	2022	10000
3	4992	987	1999	499	1523	10000
4	2031	1482	1479	987	4021	10000
5	1533	1467	1461	531	5008	10000
6	2031	5947	1017	493	512	10000
7	3513	2466	504	494	3023	10000
8	3000	1992	475	295	4238	10000

9	4992	987	504	494	3023	10000
10	1019	5958	491	510	2022	10000

As per KA, we segregate each user's response into several categories as explained earlier. The classification of the factors obtained from KA can be found in section 6.

## 6. RESULTS

The classification of the user's responses into categories can be observed in Table 5.

**Table 5: Categorized results after Kano Analysis**

	Attractive (A)	One Dimensional (O)	Must Be (M)	Indifferent (I)	Reverse (R)	Questionable (Q)
Toll culture	0	0	0	2014	4945	3041
Conflict of equality	2961	0	2498	987	0	3554
Collection of tolls	0	0	0	3454	4501	2045
O&M	513	0	1215	2249	0	6023
Private Involvement	3973	0	0	2495	491	3041

In each case, we can observe that the sentiments of the people have been reflected directly. In the first question, we have assumed that about 50% of the population is against tolls, and the results have resonated with the largest value of 4945 (i.e. ~50%) found in the Reverse (R) category. The responses under the Questionable (Q) category received a value of 3041 indicating that these responses are from people who are not clear about their opinion. On the other hand, responses under the Indifferent (I) category got a value of 2014 indicating that the people do not have any opinion about the concern. So the value of 4945 in (R) suggests that people are against tolling. So tolling is a concern for this population, which suggests the agencies should consider Availability Payment PPPs or the traditional project delivery method.

For the second concern about equality, approximately 25% (referring to the score of 2498) believe that PPPs are creating social inequalities. 987 responses out of 10,000 people did not have an opinion on this concern. 29.61% of respondents believe that PPPs create inequality but that is acceptable to them. The Q category has about (~36%) responses and is ignored. This indicates that toll roads could create a sense of social inequality in the region. The third concern about collection of tolls was found to show 'Indifferent' (~35%) as a result which means people don't have an opinion on it. On the other hand, approximately 45% people were in 'R' category which means the people are against private sector collecting tolls.

Regarding Operations & maintenance, a few people (~5%) wanted private agencies to operate & maintain whereas the majority of the people were 'Indifferent' (~22.5%) or 'Must be' (~12.5%) suggesting that the overall population will accept private agency operating and maintaining the asset. About 60% respondents are in Q category which creates a situation of instability in peoples' behavior at a later stage if they have more information about the project. Awarding higher levels of responsibilities to private entities was observed to be accepted by the people as about 40% of the people were supporting it (Category A) and 25% of people didn't have an opinion (Category I) about it. Very small percentage of people was found to be against higher levels of participation.

In this way, KA can be used to segregate the people's opinion into more informative categories which will be extremely helpful to the government agencies if they want to understand the people's opinion, develop outreach program and ensure PPP success.



## 7. LIMITATIONS

With KA trying to capture the emotion of a respondent through a functional and dysfunctional question, each concern leads to two questions on the survey. If there are 5 concerns that need to be analyzed, the questionnaire will have 10 questions. This can lead to a lengthy questionnaire. However, the authors believe that this limitation is partially reduced because the responses are generally designed to capture the respondent emotions which will decrease the response time.

Preparing a KA questionnaire requires more effort than a traditional questionnaire because the responses for each question must be designed to capture the emotions of respondents. Questions with numerical values could pose a challenge for the person preparing the questionnaire.

While Kano analysis is better than the traditional survey instruments, getting survey responses is still similar to the traditional survey. This can be overcome by following best practices (Kelley et al. 2003) and methods that are well established to conduct such surveys (Zimowski et al 1997).

## 8. CONCLUSION

PPPs are complex project delivery methods that require meticulous assessment and decision making. Persistent attempts have been made by researchers to ensure that the best PPP type is selected. Research efforts have been mainly focused towards conventional issues such as user demand, risk transfer, and value for money amongst a few others. This has left a major gap between people expectations and agencies' goals. Agencies use various methods of analysis but they are highly limited in terms of extracting all the desired information.

This research work puts forward KA method to extract the maximum amount of information using simple questionnaire surveys. KA enables convenient analysis and interpretation. KA can be conveniently used for selecting the best project delivery option meeting people's expectations. For example, in our analysis, we had results indicating resistance to tolls but acceptance to private sector's involvement in public projects. This clearly indicates that the agencies can go ahead with Availability Payment PPPs. The results will also enable agencies to strategically design outreach programs to educate people wherever needed. For example, in this research, we found that the population is concerned about social inequality. So the agencies should find out ways to address this issue.

Through this paper, it can be concluded that KA will capture a very clear picture of people's opinions. A very clear understanding of opinions will enable government agencies to develop an outreach program for educating the people and selecting the best possible PPP for the region. Future works include conducting actual surveys and analyzing people's opinion data using Kano analysis.

## 9. REFERENCES

- Berger, C., Blauth, R., Bolster, C., Burchill, G., DuMouchel, W., Pouliot, F., Richter, R., Rubinoff, A., Shen, D., Timko, M. and Walden, D. (1993), "Kano's methods for understanding customer - defined quality", *The Center for Quality Management Journal*, Vol. 2, No. 4, pp. 3 – 36
- Ng S. T., Wong Y. M.W., and Wong J. M.W. (2012 a) "Factors Influencing the Success of PPP at Feasibility Stage - A Tripartite Comparison Study in Hong Kong", *Habitat International*, Vol (36), pp. 423-432.
- Ng, S. T., Wong, J. M. W., and Wong K. K.W (2012 b) "A public private people partnerships (P4) process framework for infrastructure development in Hong Kong". *Cities*, Vol. 31, p. 370-381.
- GAO (2008) "Highway Public-Private Partnerships: Securing Potential Benefits and Protecting the Public Interest Could Result from More Rigorous Up-Front Analysis". GAO-08-1052T, U.S. Government Accountability Office, July 24, 2008
- Soomro M. A., and Zhang X. (2015) "Roles of Private-Sector Partners in Transportation Public-Private Partnership Failures" *Journal of Management in Engineering*, Volume 31 (4), pp. 04014056-1 to 04014056-12.

- Dixon T., Pottinger G., and Jordan A. (2005) "Lessons from the Private Finance Initiative in the UK", *Journal of Property Investment & Finance*, Vol. 23 (5) pp. 412 – 423
- Jacobson C., and Choi S. O., (2008), "Success Factors: Public Works and Public-Private Partnerships", *International Journal of Public Sector Management*, Vol. 21 (6) pp. 637 – 657
- Chan A. P. C., Lam P. T. I, Chan D. W. M., and Cheung E. (2008) "Risk-Sharing Mechanism for PPP Projects – the Case Study of the Sydney Cross City Tunnel". *Surveying and Built Environment*, Vol 19(1), pp. 67-80
- Cui Q., Sharma D. K., Farajian M., Perez M, and Lindly J (2010). "Feasibility Study Guideline for Public Private Partnership Projects". Report No. 930-722R, ALDOT.
- Power G., Burris M, Vadali S. and Vedenov D. (2009) "Valuation of Buyout Options in Comprehensive Development Agreements". Texas Transportation Institute, Department of Transportation Research and Innovative Technology Administration, UTCM Project
- Sharma D. K., Cui Q., Chen L and Lindly J. K. (2010). "Balancing Private And Public Interests In PPP Contracts Through Equity Capital Structure Optimization." Vol 2151/2010, pp 60-66, Transportation Research Record (TRR), Journal of the Transportation Research Board.
- Zhang X (2009), "Best Value Concessionaire Selection Through A Fuzzy Logic System", *Expert Systems with Applications*, Volume 36, Issue 4, May 2009, Pages 7519-7527,
- McCowan A. K. and Mohamed S.(2007)"Decision Support System to Evaluate and Compare Concession Options". *Journal of Construction Engineering and Management* 133(2), pp 114–123
- Brandao, L. E. T. and Saraiva, E. (2008). "The Option Value of Government Guarantees in Infrastructure Projects". *Journal of Construction Management and Economics*. 26, pp 1171-1180.
- FHWA (2012) "Establishing A Public - Private Partnership Program: A Primer". Office of Innovative Program Delivery, US Department of Transportation.
- PPIAF (2009) "Toolkit for Public Private Partnerships in Roads and Highways," Public Private Infrastructure Advisory Facility, World Bank.
- Rohman M. A., Doloi H., and Heywood C (2015) "The Community Perspective of the Social Benefit of Public Private Partnerships (PPP) Toll Road Projects". The Australian Universities' Building Educators Association Conference, Royal Institute of Chartered Surveyors, Sydney.
- Majamaa W., Junnila S., Doloi H., and Niemisto E. (2008) "End-user Oriented Public Private Partnerships in Real Estate Industry". *International Journal of Strategic Property Management*. Vol. 12, pp. 1-17.
- NCHRP (2010) "Effective Public Involvement Using Limited Resources". Synthesis 407, Report published by Transportation Research Board of the National Academies, Washington DC
- Kasper H. and Saha D. (2015) "2015 Global PPI Update" – A note by Public-Private Partnership Group of the World Bank, and the Private Participation in Infrastructure Database (PPI Database)
- PPP Canada (2014) "New Building Canada Fund: Procurement Options Analysis Guide" PPP Canada, Report downloaded from <http://www.p3canada.ca/en/about-p3s/p3-resource-library/the-new-building-canada-fund-procurement-options-analysis-guide/> on 2/15/2017.
- Mikulić J. 2007, "The Kano Model—A Review Of Its Application In Marketing Research From 1984 To 2006", The 1st International Conference of Marketing Theory Challenges in Transitional Countries, September 20–21, Maribor, Slovenia. The Institute of Marketing at the Faculty of Economics and Business, University of Maribor
- Wu and Wang, 2012 "A Continuous Fuzzy Kano's Model For Customer Requirements Analysis In Product Development" *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, 226 (3) (2012), pp. 535–546
- Ke, Y., Wang, S. Q., Chan, Cheung E. (2010) "Value for Money Analysis in U.S. Transportation Public-Private Partnerships" *Journal of Construction Engineering and Management*, Vol. 135, No. 10, Pp. 1076-1086.
- Kelley K., Clark B., Brown, V., and Sitzia J. (2003) "Good Practice in The Conduct and Reporting of Survey Research" *International Journal for Quality in Health Care*, Vol. 15 (3), pp. 261-266
- Zimowski, M., Tourangeau, R., Ghadialy, R., and Pedlow S. (1997). "Nonresponse In Household Travel Surveys" Prepared for Federal Highway Administration, NORC, Chicago, IL