

## **Using the Delphi Technique to Search for Empirical Measures of Local Planning Agency Power**

**Amal K. Ali**

Brock University, Canada

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*This paper shows how the Delphi technique was used to conceptualize and operationalize local planning agency power. In the first of two Delphi studies, twelve scholars suggested four dimensions of agency power: legal authority, degree of control, relative autonomy, and capacity. In the second Delphi study, sixteen professional planners operationalized power dimensions proposed by the first Delphi study. The dimensions were operationalized in the context of Florida's planning system. The proposed measures were tested empirically by reviewing Florida statutes, surveying municipal planning agencies, and conducting statistical analysis. This research presents important lessons learned for researchers interested in Delphi studies and proposes valid empirical measures of local planning agency power. Key Words: Delphi Technique, Power, and Local Planning Agencies.*

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### **Introduction**

The Delphi technique was developed in the 1950s at the Rand Corporation, by Helmer and Dalkey as a qualitative research methodology for forecasting and problem solving of complex topics (Benarie, 1988; Woudenberg, 1991). It seeks to reach consensus among participants about an issue of concern (Cho, Jeong, & Kim, 1991; McClave & Benson, 1988; Waissbluth & De Gortari, 1990) through a survey consisting of a series of rounds with questionnaires (Fontana & Frey, 1994).

The Delphi methodology has been applied in many fields such as public administration, economics, business, resource and environmental management, education, health care, energy policy, and urban and regional analysis because of its various advantages. (Miller, 1993). It is an inexpensive research methodology involving experts without physically bringing them together (Masser & Foley, 1987). The validity and reliability of findings of Delphi studies come from combining expert judgments (Bardecki, 1984; Parente, Anderson, Myers, & O'Brin, 1984). In addition, the anonymity of Delphi participants allows them to interact, rethink, and compare their thoughts in a "non-threatening forum" without being influenced by each other's opinion (Miller 1993, p. 198). However, this anonymity may exclude group interactions, which may reduce the accuracy of group judgments (Woudenberg, 1991).

Two approaches of the Delphi technique should be distinguished: conventional and policy. Conventional Delphi is a "decision-making tool" that has been adopted in most Delphi studies. On the other hand, policy Delphi is a "decision-facilitation tool" to generate possible opposing views for certain policy issues by participants who are not

necessarily experts in the research topic of inquiry (De Loe, 1995; Linstone & Turoff, 1975). Unlike conventional Delphi, policy Delphi does not seek to build consensus among panelists, but attempts to generate alternatives or arguments for and against certain policies. Alternatives produced by Delphi policy help policy makers choose the most appropriate policies (Turoff & Hiltz, 1996).

This research paper shows how the conventional Delphi can be a useful tool to explain ill-defined topics in the field of urban and regional planning. It points to strengths and limitations of the technique based on the findings of two Delphi studies, conceptualizing and operationalizing the power of local planning agencies. The planning literature lacks empirical measures expressing the levels of power that local planning agencies have over decision-making. These measures are needed to analyze and compare levels of local planning agency power across municipalities, and trace changes in these levels overtime when changing planning systems. The major question of this research is: how can local planning agency power be measured? To address this question, two Delphi studies were conducted. In the first Delphi study, participants conceptualized local planning agency power by proposing major dimensions of that power. In the other study, panelists developed measures for each power dimension, suggested by the first Delphi study, in the context of Florida's growth management program. Although surveys investigating opinions are not scientific experiments with potentials to harm participants, the researcher followed academic procedures to get an approval related to human subject requirements. The overall project was exempted per the Code of Federal Regulations, Section 46.101(b)2 concerning human subjects.

### **Research Design**

The two Delphi studies were designed to include three major components of conventional Delphi research. These components are: (1) creating a panel of anonymous experts on an issue of concern, (2) conducting a series of rounds by using questionnaires to get expert opinions on that issue, and (3) sharing feedback of respondents with all participants (Bardecki, 1984; Masser & Foley, 1987). In this research project, each of the two Delphi studies had a different panel of participants, knowledgeable in the topic of inquiry. In the first Delphi study conceptualizing local planning agency power, participants were professors and researchers with diverse expertise in urban planning. In the second Delphi study operationalizing local planning agency power, panelists were professional planners with significant expertise in planning practices.

De Loe (1995) suggests ten to fifty as an optimal number of participants in a Delphi survey to produce valid results. Miller (1993) argues that thirty responses would generate sufficient information regarding an issue investigated, because feedbacks beyond the first thirty responses are more likely to be repetitive without adding new information. However, this research project shows the difficulty of involving a large number of planning experts in a Delphi study because of time constraints and conflicting schedules of participants. Therefore, twelve professors and researchers participated in the first Delphi study and sixteen professional planners contributed to the second study. While conducting the Delphi surveys, none of the participants knew who else was involved in the surveys. This information was withheld to guarantee anonymity of

participants. However, permission was given by most participants to list their names in the final research paper as contributors to the Delphi surveys.

In a conventional Delphi study, as Masser and Foley (1987) indicated, a series of questionnaire rounds are used to obtain iterative responses to an issue of inquiry. Woudenberg (1991) suggests two to ten as an appropriate number of rounds. Accuracy is expected to increase over rounds because of the repetition of judgments and group pressures for conformity despite the anonymity of responses. In this research project, the progress of Delphi rounds made three rounds sufficient to obtain valid results without putting much pressure on participant time. A questionnaire was designed for each round based on responses to the previous one. Both the Delphi surveys were conducted via electronic mail and follow-up e-mail was used to encourage prompt responses to the questionnaires. Like other conventional Delphi studies, responses to round questionnaires were analyzed and summarized. Responses to each round questionnaire were grouped under major categories: agency legal authority, relative autonomy, control, and capacity.

Findings of Delphi research have been perceived credible and trustworthy because they were produced by experts in regards to the issue of concern. The first Delphi study, following procedures of a typical conventional Delphi study, showed that processes to build consensus produce pressures on participants for conformity, as Woudenberg (1991) suggested. Therefore, the second Delphi study adopted majority voting as an alternative that can generate reliable findings without pressing for consensus. To examine the credibility of the findings produced by majority voting, the researcher interviewed three scholars who did not participate in the Delphi survey. The following sections explain major procedures and findings of the two Delphi studies.

### **First Delphi Study: Conceptualizing Local Planning Agency Power**

The first Delphi study conceptualized local planning agency power by proposing major dimensions of that power. The first step in conducting that study was to identify scholars knowledgeable in local planning agencies and planning systems. To guarantee diversity in their experience, participants in the study were professors in planning schools from different countries, or analysts in international research centers with research interests and experience in growth management and/or governmental planning agencies. Participants were identified through searching websites of planning schools and international research centers. The research was limited to schools and centers having websites in English because of language barriers.

In addition, the researcher contacted the information sections in the World Bank, United Nations, and the United State Agency for International Development (USAID) to seek their help in identifying experts in the research topic. Direct contacts were helpful in getting suggestions from other scholars concerning whom to include in the Delphi study. After completing the search process, a list of specialist names and contact information was prepared, and a letter was e-mailed to invite these specialists to participate in the first Delphi study. Twelve experts agreed to participate in the Delphi study consisting of three rounds. Each round took three to four weeks to be completed.

Round One was an effort to brainstorm major dimensions of local planning agency power. The response rate to the questionnaire was relatively low (i.e., out of the twelve experts agreeing to participate in the study, four responded to the questionnaire,

two did not respond, and six dropped out). Illness, personal commitments, and/or busy schedules were major reasons for expert withdrawal from the study. However, the researcher felt that the open-ended questions used in Round one discouraged experts with busy schedules to participate in the study. Responding to open ended questions is more time consuming than close-ended questions (see Appendix A for Round One questionnaire). Participants in this round proposed authority, control, capacity, and human, fiscal, and technical capacity as dimensions of local planning agency power.

Before starting Round Two, the researcher needed to resolve two problems: (1) the lack of sufficient information resulting from the low response rate to Round One and (2) the need for new participants to replace those who withdrew from the study. To overcome the first problem, it was necessary to design the Round Two questionnaire based on responses to the questionnaire of Round One combined with the literature of power. The second problem was resolved by inviting other scholars having substantial experience and knowledge in the research topic to participate in the Delphi survey. Fortunately, six experts agreed to participate in Rounds Two and Three of the Delphi study. Therefore, the number of participants remained twelve over the rounds of the survey. Contributors of the Delphi study were professors from universities in the U.S.A., U.K., and Hong Kong, and researchers in International Development centers.

The questionnaire of Round Two was e-mailed to participants to comment on proposed dimensions of local planning agency power and to add other dimensions missing in the list. The rate of responses to this round was relatively high (eleven out of the twelve participants responded to the questionnaire). This might partially be due to the more specific nature of the questions of Round Two, which stimulated participant reactions. (See Appendix B for Round Two questionnaire).

Round Three informed participants of the findings of the analysis of responses to the questionnaire of Round Two, and requested their final affirmation/comments on revised and added dimensions of local planning agency power. (Appendix C shows the questionnaire of Round Three. Eleven out of the twelve participants responded to Round Three. The analysis of the questionnaire indicated that consensus was reached regarding all major dimensions of power (e.g., authority, autonomy, control, and capacity) and two sub-dimensions of agency capacity (e.g., technical and institutional capacity). However, consensus was not reached for the scope of power dimension and the sub-dimensions of human capacity and enforcement capacity because four participants did not vote for these dimensions. Masser and Foley (1987) suggested asking participants who would disagree with the group to rethink and justify their opinions. Therefore, the researcher sent individual questionnaires to the four participants to inform them about results of Round three, and to ask them to clarify whether their positions would change based on that feedback. The four participants agreed on the scope of power dimension and the human and enforcement capacities as sub-dimensions of local planning agency power, which created the desired consensus on findings of the Delphi survey. Table 1 shows how consensus among scholars was reached about major dimensions of local planning agency power.

Table 1

*Summary of Responses to Rounds of the First Delphi Survey Conceptualizing Local Planning Agency Power*

Proposed Dimensions of Local Planning Agency Power	Round #1	Round #2	Round #3
	N= 4	N= 11	N= 11
Legal authority to undertake planning decisions.	Proposed	10	11
Relative autonomy over processes of decision-making	\a	7	11
Degree of control over plan implementation	Proposed	8	11
Capacity to make planning decisions:	Proposed	9	11
Human Capacity	Proposed	9	11
Technical Capacity	Proposed	9	9
Fiscal Capacity	Proposed	9	11
Institutional Capacity	\a	8	11
Enforcement Capacity for Planning Regulations		Proposed	10
The Scope of power over decision-making		Proposed	8

N= Number of contributors to the round

\a =Added from the literature of power

In this research, the process of building consensus, a goal of conventional Delphi studies, raised doubts about the study's findings as a result of pressures for conformity. When discussing the proposed power dimensions with other scholars, some scholars perceive agency capacity as a factor contributing to power, not as a dimension of agency power. This reveals the existence of a disagreement on that dimension among scholars despite the consensus suggested by the Delphi study. In addition, the process of building consensus hides debates on controversial issues. For example, seven out of the eleven respondents agreed that the scope of power is a dimension of local planning agency power. A participant considered the scope of agency authority to make decisions an important dimension of power. Another participant suggested that a local planning

agency could have power over a narrow but an important range of issues, which is considered a high level of power. Since the scope of power is concerned with the range of decisions/actions over which the agency has authority, the researcher added it to sub-dimensions of agency legal authority to undertake planning decisions. Moreover, the human and technical capacity dimensions were combined in a sub-dimension of agency capacity, because both reflect staff capability to perform planning tasks. Figure 1 indicates the final list of dimensions of local planning agency power.

*Figure 1: Findings of the first Delphi study conceptualizing local planning agency power.*

### Major Dimensions of Local Planning Agency Power over Decision-Making

1. Legal authority to make planning decisions  
Includes two components: (1) the degree of devolved/delegated authority given by the state/country constitution, law, or a local charter to undertake planning tasks and regulate and designate the use of lands and (2) the scope of decisions/actions over which the agency has authority.
2. Relative autonomy over decision-making  
The extent of the freedom of the agency to: (1) seek out strategies allowing them to act on local interests without substantial interference or oversight from upper level agencies and (2) avoid subjection of local plans to regional or state/national development plans.
3. Degree of agency control of local planning actions and daily decisions  
Implies: (1) the localization of processes of economic decision-making and (2) the extent to which the agency exercises control or influence over day-to-day planning decisions.
4. Overall capacity of the agency to make planning decisions  
Includes skills and resources enabling the agency to make planning decisions. Agency capacity consists of human and technical, fiscal, institutional, and enforcement capacity.
  - 4.1 Technical & Human capacity  
The capability of the agency staff to: (1) analyze scenarios and draft a comprehensive plan, (2) build a technically sound and citizen-supported plan, and (3) conduct effective planning linked to implementation and future outcomes of land use decisions.
  - 4.2 Fiscal capacity  
Implies: (1) the adequacy of resources the agency has to perform planning tasks and (2) its capability to produce revenues independent of the national/ state government.
  - 4.3 Institutional capacity

Agency ability to: (1) create an enabling environment within the agency, (2) forge effective links with other planning agencies in the local and upper levels of government, (3) facilitate the participation of citizen groups, and (4) link with interested groups/institutions with an agenda in the area such as business groups and non-governmental agencies.

4.4 Legal Enforcement capacity  
Ability to monitor both compliance with land use regulations and the impact of planning policies.

### **Second Delphi Study: Operationalizing Local Planning Agency Power in the Context of Florida's Planning System**

The conceptualization of local planning agency power proposed by the first Delphi study was the foundation used to conduct the second Delphi study. Participants in the second study developed measures of local planning agency power in the context of Florida's planning system. The Delphi survey consisted of three rounds. On average, each round took three weeks to be completed. The survey unit of analysis is a governmental local agency responsible for planning within Florida's municipalities. To select participants in this study, four experts affiliated with Florida Department of Community Affairs, Regional Planning Councils, Florida State University, and the American Planning Association were asked to nominate professional planners with expertise in Florida's planning practices. Electronic mail was sent to invite nominated planners to participate in the second Delphi study. Although twenty-eight professional planners agreed to participate in the study, sixteen contributed to the survey rounds. Contributors to the study are affiliated with city, county, regional, state, and private planning agencies.

The Delphi survey was conducted via electronic mail. Follow-up e-mail was used to encourage prompt responses to the round questionnaires. Because of concerns raised about consensus building in the first Delphi study, the second Delphi study adopted majority voting as a means to determine measures agreed upon by participants. As mentioned before, pressures for conformity may eliminate controversial issues, and may not reflect genuine positions of participants.

In the first round, participants were asked to suggest measures for each dimension of local planning agency power as indicated in Figure 1. In the second round, they voted and commented on a list of measures they proposed in the first round. Most participants agreed on measures proposed for all power dimensions except agency control and technical capacity. Therefore, the questionnaire of the third round was mainly to develop measures of agency control and technical capacity. Based on the findings of the Delphi survey, a list of measures of local planning agency power was prepared.

The first Delphi study attempted to build consensus as suggested by typical Delphi research. However, the study showed negative effects of putting pressures on participants to reach that consensus. Therefore, the researcher adopted majority voting in the analysis of the round questionnaires of the second Delphi study. To examine the credibility of findings produced by majority voting, she interviewed three scholars/professionals who did not participate in the Delphi studies and have vast

expertise in planning practices in Florida. Interviewees were affiliated with a local planning department in Florida, the American Institute of Certified Planners, and Florida State University. They were asked to suggest measures for each dimension of local planning agency power. Interviewees proposed measures agreeing with many measures proposed by participants in the second Delphi survey and added other measures. Table 2 demonstrates participant votes on measures proposed in Delphi rounds and lists the agreed-upon (and added) measures of local planning agency power by interviewees.

Table 2

*Responses to Rounds of the Second Delphi Survey and Interviews Operationalizing Local Planning Agency Power*

Major Measures Proposed	Rounds			Interviewees
	One N= 14	Two N= 14	Three N= 15	
<b>1<sup>st</sup> Dimension: Agency Legal Authority</b>				
Authority given by statutes, special acts, and local charters to revise a comprehensive plan.	Proposed	13	**	Agreeing
Authority given by statutes, special acts, and local charters to propose revisions to land development regulations.	Proposed	13	**	Agreeing
Exercise of final authority over important planning decisions.	Proposed	11	**	Agreeing
<b>2<sup>nd</sup> Dimension: Agency Relative Autonomy</b>				
Absence of oversight agencies other than the Department of Community Affairs able to veto agency decisions.	Proposed	13	**	Agreeing
Absence of local decisions requiring approval from higher-level governments prior to adoption.	Proposed	12	**	Agreeing
Inability of higher-level governments to withhold funds in cases of inconsistency.	Proposed	12	**	Agreeing
Existence of additional consistency requirements.				Added

Frequency of the Department of Community Affairs approvals of local plan amendments recommended by the agency.				Added
Authority to review annexations.				Added
<b>3<sup>rd</sup> Dimension: Agency Control over Local Actions</b>				
Absence of involvement by elected officials, administrative heads, or other municipal agencies in the agency internal operation.	Proposed	6	14	Agreeing
Absence of issues of state significance in the municipality.	Proposed	6	9	Agreeing
Ability of the agency to approve/deny applications for development without direction from the governing body.	Proposed	9	15	Agreeing
Frequency of the municipal council agreeing with recommendations of planning staff on zoning/land use proposals.		Proposed	12	Agreeing
Existence of a board of adjustment or zoning hearing examiner within the agency.				Added
<b>4<sup>th</sup> Dimension: Capacity</b>				
<b>4.1 Technical Capacity</b>				
Percentage of planning staff having a degree in planning.	Proposed	11	13	Agreeing
Availability of continuing planner education and training in evolving technologies.	Proposed	11	12	Agreeing
Percentage of planning staff having AICP certification.		Proposed	9	Agreeing
Number of years of experience of the planning staff.		Proposed	15	Agreeing
Ability to use technical software such as GIS,		Proposed	14	Agreeing

database, and statistical packages.				
Number of computer hardware.		Proposed	10	Agreeing
<b>4.2 Fiscal Capacity</b>				
Percentage of total agency revenues from fees on planning services and land development regulations.	Proposed	8	**	Agreeing
Adequacy of funds to hire consulting services.	Proposed	12	**	Agreeing
Adequacy of the agency budget to support planning functions.	Proposed	15	**	Agreeing
Rates of professional planner turnover.	Proposed	11	**	Agreeing
<b>4.3 Institutional Capacity.</b>				
Number of other local governmental agencies with which the planning agency interacted last year.	Proposed	12	**	Agreeing
Number of inter-local agreements specifically related to planning.	Proposed	10	**	Agreeing
Planner participation in planning activities within regional planning council last year.	Proposed	12	**	Agreeing
Number of public hearings held by the agency last year.	Proposed	12	**	Agreeing
Number of meetings with citizen groups held by the agency last year.	Proposed	11	**	Agreeing
Participation in boards of other local government agencies.				Added
<b>4.4 Enforcement Capacity</b>				
Responsibilities to approve/deny development projects for consistency with comprehensive plans.	Proposed	13	**	Agreeing
Adequacy of resources provided for	Proposed	15	**	Agreeing

enforcement actions.				
Ability to impose fines for violation for planning regulations.	Proposed	12	**	Agreeing
Percentages of planning staff recommendations related to enforcement, which were overturned last year.	Proposed	10	**	Agreeing

N Number of contributors to the round.

\*\* Omitted from the survey of Round three because consensus was reached in Round two.

Two methods were used to test the measures proposed by the second Delphi study empirically. The first method was to review Florida statutes, to identify measures determined by law and uniform across Florida's municipal planning agencies.<sup>1</sup> These measures were excluded from the final list of measures because of their lack of variations. The second method to test proposed measures empirically was to survey planning agencies within Florida's municipalities having 10,000 or more inhabitants. Municipalities with directors/planners participating in the second Delphi study were excluded from the survey to avoid any bias in survey responses. A self-administered questionnaire was mailed to 142 planning agencies within Florida's municipalities; 104 participated in the survey. Questions with multiple choices were used to facilitate the analysis, while open-ended questions were adopted when expecting broad responses. Appendix D illustrates questions investigating the measures proposed by the second Delphi study. The data collected from the survey was analyzed to construct indices based on the proposed measures. Variables proposed by the Delphi study were dropped from the list of measures if they: (1) have high rates of missing values,<sup>2</sup> (2) do not vary across planning agencies within Florida's municipalities,<sup>3</sup> and (3) are strongly associated (measures of associations > .85) with a variable included in an index.<sup>4</sup> Based on the

<sup>1</sup> Florida statutes specify local planning agency responsibilities for preparing the comprehensive plan or plan amendment and reviewing proposed land development regulations, land development codes, or amendments, and reporting to the governing body issues related to consistency with adopted comprehensive plans if the agency is required to do so (s.163.3171, F.S.).

<sup>2</sup> The variable "existence of additional requirements for consistency set by upper level agencies" was dropped from the autonomy measures because it has 11% of missing cases; and "the sufficiency of fiscal resources provided for enforcement actions" was excluded from the fiscal capacity measures due to 34% of missing cases.

<sup>3</sup> The variable "the adequacy of funds to hire consulting services" was dropped from the technical capacity measures because 95% of agencies hired consulting services in the last five years; "the availability of continuing planning education and training in evolving technologies" was dropped from the technical capacity measures since 93.3% of agencies provide opportunities for professional planners to continue their education; and "the agency reviews and recommends annexation requests" was excluded from the autonomy measures because over 94% of planning agencies do not have the authority for annexation reviews.

<sup>4</sup> The variable "ability of professional planners to use technical software programs" was dropped from the

findings of testing the proposed measures empirically, a final list of measures was prepared for each dimension of local planning agency power as follows.

## **Proposed Empirical Measures of Local Planning Agency Power in the Context of Florida's Planning System**

### **1. Agency legal authority**

- Scores of authority given to the agency by local ordinances, special acts or charters to revise comprehensive plans. [Continuous variable]
- Scores of authority given to the agency by local ordinances, special acts or charters to land development regulations. [Continuous variable]

### **2. Agency relative autonomy**

- Absence of upper level agencies other than the Department of Community Affairs with authority to veto planning agency decisions. [1= Yes, 0= No]
- Frequency of the Department of Community Affairs approval of local plan amendments proposed by the local agency. [0= Never, 1= Rarely, 2= Frequently, 3= Always]

### **3. Agency control of day-to-day actions**

- Absence of the local governing body involvement in the process of approving or denying applications for development. [0= Always, 1= Frequently, 2= Rarely, 3= Never]
- Frequency of the municipal council agreeing with planning staff recommendations on zoning or land use proposals. [0= Never, 1= Rarely, 2= Frequently, 3= Always]
- Existence of a board of adjustments or zoning hearing examiner within the planning agency.

[1= Yes, 0= No]

### **4. Agency capacity to make planning decisions**

#### **4.1 Technical & Human Capacity**

- Percentage of professional planners having a degree in planning. [Continuous variable]
- Number of years of planning experience of agency staff. [Continuous variable]
- Scores of available computer software programs in an agency. [Continuous variable]

#### **4.2 Fiscal Capacity**

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technical capacity measures because of its very strong correlation with “the number of years of the experience of planning staff.”

- Adequacy of the agency budget to support planning activities. [0= Yes, 1= No]
- Rate of professional planners left the agency for any reason in the last two years. [Continuous variable]

#### **4.3 Institutional Capacity**

- Number of other local governmental agencies with which the agency interacted at least once a month last year. [0= None, 1= 1-3, 2= 4-6, 3= 7+]
- Professional planner participation in planning activities with the regional planning council in the last two years. [0= No, 1= Yes]
- Number of public hearings held by the planning agency last year. [0= None, 1= 1-12, 2= 13-52, 3=53+]
- Number of meetings with citizen groups or special interest held by the planning agency last year. [0= None, 1= 1-12, 2= 13-52, 3= 53+]
- Participation in boards or committees of other local governmental agencies last year. [0= No, 1= Yes]

#### **4.4 Enforcement Capacity**

- Responsibility to approve development applications. [0= No, 1= Yes].
- Ability to impose fines for violation of development regulations. [0= No, 1= Yes].

The proposed measures by this Delphi study can be used separately to analyze levels of agency power dimensions or jointly to express levels of the overall power a local planning agency has. In addition, the proposed set of measures could be used to study local planning agencies in other states, after considering planning and political contexts in which planning agencies operate.

### **Concluding Remarks**

This research paper shows how the Delphi technique was used to conceptualize and operationalize local planning agency power. The first Delphi study identifies four major dimensions of local planning agency power, which are: (1) legal authority to undertake planning decisions, (2) the relative autonomy over decision-making, (3) the degree of control of planning actions, and (4) capacity to make planning decisions. The other Delphi study suggests empirical measures for power dimensions proposed by the first Delphi study. This research indicates strengths and limitations of the Delphi technique that agree with previous studies.

### **Strengths of the Delphi Technique**

The findings of this research demonstrate the effectiveness of the Delphi technique as a qualitative method seeking to clarify ill-defined topics. The two Delphi studies presented in this paper succeeded in conceptualizing and operationalizing local planning agency power, which fills a partial gap in the planning literature. As Masser and Foley (1987) suggested, the Delphi technique is an inexpensive and reliable tool to obtain

valid judgments about an issue of concern. It gives participants opportunities to rethink their ideas through multiple rounds indicating results of previous rounds, and allowing participants to reconsider their positions toward issues of concern based on feedback received from other members of a panel. This research paper demonstrates the flexibility of the Delphi technique that can be applied from different approaches (e.g., using majority voting instead of consensus) with different methods of communication such as electronic and regular mail.

Moreover, this research shed some light on the debate over the advantages and disadvantages of participant anonymity in Delphi research. Miller (1993) supported the anonymity of participants because it allows them to express their opinions freely without threats of peer pressures, while Woudenberg (1991) considered this anonymity a barrier for group interactions. The research shows the need to keep participants anonymous in Delphi studies. In the first Delphi study, anonymity was essential because many participants are known professors in the field of Urban and Regional Planning, which can influence decisions of other participants if identities are revealed. In the second study, anonymity assured confidentiality, which enabled professional planners to express their opinions freely without facing peer pressures for conformity.

### **Limitations of the Delphi Technique**

Despite its advantages, the Delphi technique has limitations indicated by this research. As De Loe (1995) suggested, a Delphi study takes a long time and considerable effort to be completed. As the first Delphi study indicates, participant drop out is likely to occur if the numbers of Delphi rounds increase or the questions are broad. It is difficult to encourage a large number of experts to volunteer in a Delphi study. The limited budget of this research made it impossible to provide monetary incentives to stimulate participation in the two Delphi studies.

In addition, identifying participants who are knowledgeable about the issue searched is a challenge, as Masser and Foley (1987) indicated. In the first Delphi study, the researcher relied on scholar suggestions, searching websites of universities and research centers, and the knowledge of the researcher of potential participants. In the second study, four professors and professional planners who have strong contacts with Florida's local planning agencies nominated potential participants familiar with local planning systems and practices.

Woudenberg (1991) pointed to the effects of pressures for conformity to build consensus in Delphi studies, which may produce inaccurate conclusions about participant opinions. Coates (1975) argued "the value of the Delphi method is not in reporting high reliability consensus states, but rather in altering the participants to the complexity of issues by forcing, cajoling, urging, luring them to think, by having them challenge their assumptions" (p. 194). To investigate this issue, the first Delphi study attempted to build consensus on major dimensions of agency power. The study showed that pressures for conformity eliminate participant disagreements on controversial issues. It was not clear whether participants changed their positions in the third round based on pressures for conformity or genuine beliefs. Therefore, in the second Delphi study, majority voting was used to determine measures agreed upon by most professional planners. Interviews with scholars/professionals support the outputs of the second Delphi study, which suggests majority voting as an alternative to analyze responses to Delphi questionnaires. Majority

voting shows differences in opinions among participants, which provides more illustrations of the issue of concern. Observing the progress of the Delphi surveys supports concerns of Woudenberg regarding the lack of participant interactions in Delphi surveys because of needs to keep participants anonymous.

The previous discussions reveal strengths and limitations of the Delphi Technique. Based on these discussions, seven suggestions are provided to minimize problems faced when conducting Delphi surveys.

1. Using broad questions in the first round of a Delphi survey may discourage experts with time constraints to participate in a study, which was indicated by the drop out of some participants in the first Delphi study accommodate. Less broad survey questions should be considered to stimulate expert participation in a Delphi study.
2. The time scheduled to conduct a Delphi study should be flexible to conflicting schedules of participants, and give participants sufficient time to think and rethink about issues of concern without time pressures.
3. Follow-ups are critical to have prompt responses to survey rounds. A researcher should not be discouraged by low response rates to Delphi rounds. Instead, he/she should find ways to seek more participation by sending follow-ups for each round until a required rate of response is reached.
4. Providing incentives (e.g., monetary, certificates of appreciation from a major institution, and gifts) to contributors to a Delphi study will encourage more experts to participate and respond promptly to Delphi round questionnaires.
5. Using e-mail to conduct a Delphi survey is effective, fast, and cheap, but technical communication problems in many countries, especially the developing ones, should be considered. Other methods of communication such as fax, phone calls, or regular mail can be used to conduct a Delphi survey when problems with e-mail exist.
6. Adopting majority voting as a means to analyze responses to Delphi rounds would produce reliable findings and demonstrate controversial issues, especially in large panels.
7. Categorizing responses to Delphi surveys (e.g., legal authority, relative autonomy, levels of control, and capacity) enabled the researcher to summarize responses to round questionnaires. That can help the analyst summarize responses to Delphi rounds when participants have diverse expertise and provide a wide range of valid responses.

Overall, this research paper indicates that strengths of the Delphi technique outweigh its limitations. It is an effective qualitative methodology to clarify ill-defined issues/topics in urban and regional planning.

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## Appendix A

### Round One Questionnaire of the First Delphi Study

The goal of this round is to propose major dimensions of local planning agency power over decision-making from a broad perspective. These dimensions can be related, but are not limited, to economic, political, and administrative aspects of power. Local planning agency power could express the capacity, autonomy, control, and authority of local governmental planning agencies to make decisions serving local interests without interventions from higher levels of government.

**The Survey Question:**

What are the most critical dimensions of local planning agency power over decision-making? Please provide examples or illustrations to clarify your ideas.

**Appendix B****Round Two Questionnaire of the First Delphi Study**

The goal of this round is to allow participants to review and comment on proposed major dimensions of local planning agency power over decision-making. These dimensions were suggested by respondents of round one combined with my review of the literature of power.

**Instructions:**

Please indicate whether you agree/disagree with each dimension of local power by writing an "X" in front of (a) or (b). Feel free to comment on each dimension.

**Major Dimensions of Local Planning Agency Power****First Dimension**

**The authority of a local planning agency to make planning decisions.** (i.e., the degree of devolved/delegated authority to a local planning agency by the state/country constitution or law or a local charter to: (1) undertake tasks of land use/comprehensive planning and 2) regulate and designate the use of lands).

Is authority a major dimension of local planning agency power over decision-making?

(a) Yes                      (b) No

Comments:

**Second Dimension**

**The autonomy of a local planning agency over processes of decision-making.** (i.e., the freedom of local planning officials to: (1) seek out strategies allowing them to act on local interests without substantial interference or oversight from upper level planning agencies and (2) avoid subjection of local plans to regional or national development plans).

Is autonomy a major dimension of local planning agency power over decision-making?

(a) Yes                      (b) No

Comments:

### Third Dimension

**The control of a local planning agency over the implementation of local plans.** (Local control implies: (1) the localization of processes of economic decision-making and (2) the extent to which a local planning agency exercises control or influence over the provision of major infrastructure forming the basis for land development).

Is control over implementing local plans a major dimension of local agency power over decision-making? (a) Yes (b) No

Comments:

### Fourth Dimension

**The capacity of a local planning agency to make planning decisions.** (Local Capacity over decision-making consists of human, fiscal, technical, and institutional capacity).

Is capacity a major dimension of local planning agency power over decision-making? (a) Yes (b) No

If “yes,” please complete questions 4.1 to 4.4 regarding local capacity. If “no,” please go to question (5).

**4.1 Human capacity** of a local planning agency includes: (1) the adequacy of number of skilled staff able to perform planning tasks, (2) the involvement of local political leaders in setting the planning agenda for conducting land use/comprehensive planning, and (3) local policy makers' capacity and strength of political will to make decisions consistent with local plans.

Is human capacity a sub-dimension of local agency capacity to make planning decisions? (a) Yes (b) No

Comments:

**4.2 Technical Capacity** of a local planning agency can be determined by the capability of a local planning agency to: (1) analyze scenarios and drafting a comprehensive plan, (2) build a technically sound and citizen-supported plan, and (3) conduct effective planning linked to implementation and future outcomes of land use decisions.

Is technical capacity a sub-dimension of local agency capacity to make planning decisions? (a) Yes (b) No

Comments:

**4.3 Fiscal Capacity** of a local planning agency implies: (1) the financial ability of a local planning agency to compensate landowners for their losses, e.g., land taken by eminent domain and (2) the adequacy of resources of a local planning agency to perform planning tasks.

Is fiscal capacity a sub-dimension of local agency capacity to make planning decisions?  
(a) Yes (b) No

Comments:

**4.4 Institutional Capacity** implies the ability of the local planning agency to: (1) forge effective links with other agencies and (2) exercise influence over other planning agencies (i.e., local and upper levels of government).

Is institutional capacity a sub-dimension of local agency capacity to make planning decisions? (a) Yes (b) No

Comments:

**5.** Are there other major dimensions of local planning agency power over decision-making? (a) Yes (b) No

If yes, please identify these dimensions.

## Appendix C

### Round Three Questionnaire of the First Delphi Study

The goal of this round is to: (1) inform participants of the findings of the analysis of responses to Round Two of the Delphi survey and (2) request their final affirmation/comments on revised and added dimensions of local planning agency power over decision-making.

#### Part One

#### Summary table of responses to questionnaire #2

(No. participants= 11)

Major Dimensions	Responses		
	Yes	No	Don't Know
1. Authority of the agency to make planning decisions.	10	0	1
2. Autonomy of the agency over decision-making.	7	3	1
3. Control over plan implementation.	8	1	2
4. Capacity of the agency to make planning decisions:	9	1	1

4.1 Human Capacity.	9	1	1
4.2 Technical Capacity.	9	1	1
4.3 Fiscal Capacity.	9	1	1
4.4 Institutional Capacity	8	1	2
4.5 Enforcement Capacity of laws and regulations.	Proposed		
5. Scope of agency authority over planning decisions.	Proposed		

**Part Two**

**Final affirmation/comments**

1. Review the *revised and added dimensions* of local planning agency power.
- 2) Provide your *final affirmation/comments* on major dimensions of local agency power.

**First Dimension:**

**The legal authority of a local planning agency to undertake planning decisions.** (i.e., the degree or strength of devolved/delegated authority to a local planning agency by the state/country constitution or law or a local charter to: (1) undertake tasks of land use/comprehensive planning and (2) regulate and designate the use of lands).

Is legal authority a major dimension of local planning agency power over decision-making?

- (a) Yes                      (b) No

Comments:

**Second Dimension:**

**The relative autonomy of a local planning agency over decision-making.** (i.e., the extent of freedom of local planning officials to: (1) seek out strategies allowing them to act on local interests without substantial interference or oversight from upper level planning agencies and (2) avoid subjection of local plans to regional or national development plans. The relative autonomy of a local planning agency can be expressed by: (1) the ability of a higher government to veto a local decision, (2) the need of a local planning agency to get the approval of a higher level of government to local decisions, and (3) sources of funding a local planning agency).

Is Relative Autonomy a major dimension of local planning agency power over decision-making?

- (a) Yes                      (b) No

Comments:

**Third Dimension:**

**The control of a local planning agency over planning actions.** (Local control implies: (1) the localization of processes of economic decision-making and (2) the extent to which a local planning agency exercises control or influence over the day-to-day planning decisions and over plan implementation in general).

Is Control over Planning Actions a major dimension of local planning agency power?

(a) Yes                      (b) No

Comments:

**Fourth Dimension:**

**The capacity of a local planning agency to make planning decisions.** (Local Capacity over decision-making consists of human, fiscal, technical, institutional, and legal capacity).

Is Capacity a major dimension of local planning agency power?

(a) Yes                      (b) No

Comments:

If “yes,” please complete questions 4.1 to 4.5 regarding local capacity. If “no,” please go to question (5).

**4.1 Human Capacity** of a local planning agency includes two components: staff and leadership. Staff capacity refers to the number of staff with adequate skills to perform planning tasks. Leadership capacity includes: (1) visible signs/statements of leadership to support local planning processes, (2) actual involvement of leaders in setting planning agenda and decision-making, (3) political will of leaders to make decisions and implement planned changes, and (4) the stability of political orientation/viewpoints to support the implementation of comprehensive plans.

Is Human Capacity a sub-dimension of agency capacity to make planning decisions?

(a) Yes                      (b) No

Comments:

**4.2 Technical Capacity** of a local planning agency can be determined by the capability of a local planning agency to: (1) analyze scenarios and draft a comprehensive plan, (2) build a technically sound and citizen-supported plan, and (3) conduct effective planning linked to implementation and future outcomes of land use decisions.

Is Technical Capacity a sub-dimension of agency capacity to make planning decisions?

(a) Yes                      (b) No

Comments:

**4.3 Fiscal Capacity** of a local planning agency implies: (1) the adequacy of resources a local planning agency has to perform planning tasks and (2) the capability of an agency to produce revenues/income independent of the national/state government.

Is Fiscal Capacity a sub-dimension of agency capacity to make planning decisions?

(a) Yes                      (b) No

Comments:

**4.4 Institutional Capacity** implies the ability of a local planning agency to: (1) create an enabling environment within a local planning agency, (2) forge effective links with other planning agencies in the local and upper levels of government, (3) facilitate the participation of citizen groups, and (4) link with interested groups/institutions with an agenda in the area such as business groups and non-governmental agencies.

Is Institutional Capacity a sub-dimension of agency capacity to make planning decisions?

(a) Yes                      (b) No

Comments:

**4.5 Enforcement Capacity** of laws and regulation of land use/comprehensive planning.

Is Enforcement Capacity a sub-dimension of agency capacity to make planning decisions?

(a) Yes                      (b) No

Comments:

### **Fifth Dimension:**

**The scope of local power over decision-making for land use/comprehensive planning.** (i.e., the range of decisions and actions over which a local planning agency has authority).

Is the Scope of Power a major dimension of local planning agency power over decision-making?

(a) Yes                      (b) No

Comments:

## Appendix D

### Major Questions Included in the Survey of Local Planning Agencies in Florida

#### **1<sup>st</sup> Power Dimension: Agency legal authority.**

Authorities given to local planning agencies by state law are: preparing a comprehensive plan, adopting and amending a comprehensive plan, and proposing changes to land development regulations.

What are other authorities given to your planning agency by ordinance, agreements, special acts or charters?

#### **2<sup>nd</sup> Power Dimension: Relative autonomy.**

Does the Florida Department of Community Affairs frequently approve plan amendments recommended by the local government?

- a. Always   b. Frequently   c. Rarely   d. Never   e. Don't Know

Other than the Florida Department of Community Affairs, are there other agencies with the authority to veto your planning agency decisions?

- a. Yes   b. No   c. Don't know

If yes: Please specify

#### **3<sup>rd</sup> Power Dimension: Agency control over local planning actions.**

Is your planning agency responsible for approving or denying applications for development?

- a. Yes   b. No   c. Don't know

If yes: How frequently is the municipal governing body involved in the approval process?

- a. Always   b. Frequently   c. Rarely   d. Never   e. Don't Know

If no: Who approves or denies applications for development? (Circle all that apply.)

- a. Elected officials
- b. Administrative head
- c. Growth Management or similar agency
- d. Other (specify)
- e. Don't Know

Is there a board of adjustments or zoning hearing examiner within your planning agency?

- a. Yes.   b. No.   c. Don't know.

If no: To which agency is the board of adjustments or zoning hearing examiner affiliated?

How frequently does the municipal board/council agree with recommendations of planning staff on zoning/land use proposals?

- a. Always   b. Frequently   c. Rarely   d. Never   e. Don't Know

**4<sup>th</sup> Power Dimension: Agency capacity.**

4.1 Technical & Human Capacity:

How many planning positions does your planning agency have?

Full time positions.....

Part time positions.....

How many of these positions are filled by personnel with:

Less than Bachelor's degree.....

Bachelor's degree.....

Master's degree in planning.....

Master's degree in other fields.....

PhD in planning.....

PhD in other fields.....

Please indicate the number of planning staff having the following years of planning experience:

Years of Experience	Number of Staff
< 2 Years	
2- 5 Years	
6- 9 Years	
10- 13 Years	
14 Years or More	

Does your agency provide opportunities for continuing planning education for persons in planning positions?

- a. Yes      b. No      c. Don't Know

If yes: Did anyone in a planning position participate in any of the following educational programs in the last two years? (Circle all that apply).

- a. Planning schools to get a higher planning degree
- b. Planning courses provided by a planning school
- c. Training courses provided by professionals and/or academicians
- d. Other (specify)
- e. Don't Know

Please indicate how many of the professional planning staff in your agency knows how to use the following software programs.

Software programs	Number of planning staff that knows how to use the program.
GIS	
Statistical packages (e.g., SPSS/SAS)	
Spreadsheet	

**4.2 Fiscal capacity:**

Did your agency have to cut staff and/or planning activities in the last two years for budgetary reasons?

- a. Yes            b. No            c. Don't know

How many professional planners have left your planning agency for any reason in the last two years?

If professional planners have left during the last two years, what was their reason? (Circle all that apply).

- a. To seek a job with a higher salary
- b. Dissatisfied with the workload
- c. To go back to school
- d. Unsatisfactory performance
- e. Personal reasons
- f. Other (specify)
- g. Don't Know

In the last five years, did your agency hire consulting services?

- a. Yes            b. No            c. Don't know

If no: Why didn't your agency hire consulting services? (Circle all that apply).

- a. Insufficient funding.
- b. Opposition of elected local officials.
- c. Technical assistance is provided by other governmental agencies.
- d. No need to do so, planning staff is able to perform planning activities.
- e. Other (specify.) .....
- f. Don't Know.

**4.3 Institutional capacity:**

Did any of the professional planners in your agency participate in committees or boards of other local governmental agencies last year?

- a. Yes            b. No            c. Don't know

Did any of the professional planners in your planning agency participate in planning activities with the regional planning council in the last two years?

- a. Yes            b. No            c. Don't know

How many other local governmental agencies did your planning agency contact at least once a month last year?

- a. None   b. 1- 3   c. 4- 6   d. 7 or more   e. Don't Know

How many public hearings were held by your planning agency last year?

- a. None   b. 1- 12   c. 13- 52   d. 53 or more   e. Don't Know

How many meetings with citizen groups or special interest groups were held by your planning agency last year?

- a. None   b.1- 12   c. 13- 52   d. 53 or more   e. Don't Know

#### **4.4 Enforcement capacity:**

If your planning agency has enforced power, are the fiscal resources provided for enforcement actions sufficient?

- a. Yes        b. No        c. Don't Know

Is your planning agency responsible for imposing fines for violation of development regulations?

- a. Yes        b. No        c. Don't know

If no: Who is responsible for imposing fines for violation of municipal development regulations?

#### **Author Note**

Amal K. Ali is an Assistant Professor in the Department of Geography at Brock University, Canada. She has taught and conducted research in urban planning and international development. She is particularly interested in innovative research methods helping to understand planning practices. Her contact information is Dr. A. Ali, Department of Geography, Brock University, St. Catharines, ON, Canada L2S 3A1; phone 905-688-5550 Ext. 4417; Email Amal.Ali@brocku.ca

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