

University of Pécs
Faculty of Business and Economics

**BALANCE IN DECISION MAKING
BETWEEN THE PUBLIC SECTOR
AND THE PRIVATE SECTOR**

**Abstract and Thesis Statements
of a PhD Dissertation**

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Abstract

Introduction

Almost daily, we are exposed to headlines in the news media that discuss the impact of exposure to radiation of radio frequencies on the public health. Experts sow fear and mistrust in the government system that is supposed to protect us from environmental harm.

As a result, the public increases its pressure on the local authorities to forbid installing transmitters in residential areas and to remove existing antennae. Objection to the erection of a network of cellular antennae also stems from their damage to the city scenery in particular and to the scenery in general.

The current knowledge regarding the dangers of radiation to the public, the decision-making methods used and the steps taken to reduce the level of danger and to determine strict standards are concentrated in this thesis. It also offers creative solutions that exist in Israel and globally, that prevent damaging the scenery and the environment, all in order to solve the public policy decision-makers' dilemmas.

Such dilemmas exist with respect to the order of priorities, with respect to the importance of preserving public health, the environmental quality and the cityscape on the one hand, and the public service on the other, together with finding the balance between apparently contrasting trends in public policy in the realm of decision-making that is a complicated and sensitive subject. The study presents a model for finding the balance between apparently contrasting trends in public policy in the realm of decision-making, a complicated and sensitive subject. The author presents a conceptual and practical model for the installation of a network of cellular antennae in Modi'in, the newest city in Israel whose construction began in 1993 and by 2003 it had a population of about 40,000, particularly sensitive to the subject. This model depicts a method of overcoming the "antenna paradox", wherein all are interested in progress and in cellular reception but oppose antennae near to their homes.

While it is quite clear that the use of cellular phones is a given fact without which one can no longer manage, this is not the first time in history that we are most interested in wide-spread technological progress but fear it. We remember the more distant past, the early days of the steam engine and the fear of the "iron horse", our present inability to

manage mass transportation without trains and the fear of the microwave, without which it is impossible to manage in any modern home.

The research questions

1. Can the public and the private interests in public policy be compatible?
2. Is the decision-maker capable of choosing the alternative in the most professional and practical way that will maximize most of the benefits from the event, despite diverse interest groups that try to lead to the choice of alternatives that serve their interests?
3. How do individuals accept and/or perceive the chosen alternative and/or the method of decision-making and/or the elected decision-makers?

The research hypotheses

1. When stringent professional regulations exist, the public interest will supersede the private interest.
2. The greater the accountability in the decision-making process, the more positively/practically will the individuals accept it, afford the selected alternative legitimacy and even support it.
3. Decision-making that selects the alternative that leads to change of the "muddling through" type will be accepted with greater understanding amongst decision-makers than decision-making that chooses the alternative that entails far-reaching reform.
4. A framework of verbal-formal decision-making model can be developed, validated by a survey among decision-makers and be used efficiently in a real-case situation environment.

Research sources

The thesis relies on information gathered from a variety of sources, such as

- Professional literature on public administration and business administration
- Publications and journals on environmental quality and decision making
- Interviews with professionals and bureaucrats in the field
- The laws of the State of Israel
- Legal decisions regarding the topic
- Minutes of decision making sessions of the Modi'in City Council
- Internet sites on relevant issues in Israel and globally
- Media sources commenting on and presenting the problem

Several terms are central to this thesis:

- Decision – The conscious consideration of an existing situation and the choice of one method of action from several possibilities (Doron, 1986).
- Public administration - Public administration is the way in which government objectives and challenges are implemented (Caiden, 1971).
- Public policy - Gordon (1992) defines public policy as “The organized framework of objectives and basic reasons for government programs dealing with organized social problems” (p. 25). He similarly claims that public policy is in fact, “A texture of programs in divers domains, determined by the government and applied by the various government agencies” (p. 488).
- The public interest and the private interest
“Policy lacking a normative aspect; a decision to take it for the public good that cannot be justified, shall be considered as arbitrary, illegitimate policy. From the perspective of individuals in society, the public interest supercedes the private interest. From their point of view, there is particular area that is of public interest, and in which the government is entitled to intervene and influence. Every society determines for itself the size of this domain, that changes with social preferences”.
(Doron, 1986, p.21)

Disparity will always exist between the desires of individuals in society and what society wants. Public well-being is a situation of temporary balance between opinions, pressures, interest groups and so on. Those determining public policy must assure this balance when taking decisions.

Theoretical background

Decisions are not taken in a vacuum. The very fact is that each decision has a practical impact being influenced by diverse limitations. The limitations and constraints on the decision-makers are various. Some are limited by previous decisions, others must be taken in condition of lack of information and uncertainty. A type of decision exists for which the main limitation is the need to decide whether to accept it or not - due to a lack of time (such as military-operational delimitations). Some decisions are taken based on a variety of motives of the decision-makers themselves. The decision-making processes are varied and diverse. Accordingly,

many researchers propose methods that are, in fact, models that describe decision-making processes.

A decision-making model is intended to explain what the person, proposing the model, considers the main aspect of this complex process. Prior to presenting the models that discuss decision-making processes, the differentiation existing between them is presented.

It is customary to categorize models of decision-making processes into two main groups (Shilo, 1972):

1. Normative models that describe how decisions should be taken (Deri, 1998) and why should they be taken one way rather than another. One possible answer is that decisions taken according to this model will be better than those taken according to the existing process or according to another normative system. This is, of course, a hypothesis that can be tested empirically if it is possible to define a good or improved decision. Another answer is that this is rational or logical. In other words, there is not necessarily a promise of improved quality of decisions but rather an axiomatic demand: "This is how it is done, and this is rational" in view of the issue awaiting a decision.
2. Behavioral models that describe existing processes and clarify whatever needs explaining are also known as empirical models, i.e., models that aim to present an existing process. This is how decisions are taken in practice. The test of an empirical, behavioral model does not lie in its exact compatibility with reality, since as a model is emphasizes certain aspects of the reality and ignores others. It lies in its ability to elucidate that which, in the opinion of the one proposing it, needs to be explained and usually leads to the choice of the agreed alternative.

Space for consideration and discretion in decision-making did not exist in the past. This thesis reviews the knowledge pertaining to radiation and the fear of it as an integral part of decision-making. Models of decision-making processes, through which the research issues are analyzed, are presented below.

The question facing decision-makers in Modi'in was whether to continue using the old, accepted method of transmission along high frequency microwaves from large, central antennae, or whether to switch to much smaller transmission foci, safer for the population. The relevant dissertation chapter discusses classical decision-making mechanisms, as they appear in the academic literature. The subject is linked to public administration with its diverse components, to the domain relevant to this

study and to technological and environmental issues, for which stringent professional regulations have been determined. Understanding the processes for discussion by decision-makers in the public sector is important while, in this case, exploring the demands of the individual/public.

The opinions of the foremost researchers in the field are offered, such as that of Simon and March (1958), of Dror (1968, 1987), of Pressman and Wildavsky (1984), Lindblum (1995) and others. It is important to understand that the decision is the result of the process of choosing between alternatives in order to improve the decision-making process, while presenting normative and behavioral models.

Based on research by Nigro (1977), Dror (1987) and Jannis and Mann (1966), the study clarifies that the pure rational model presented is the one to be striven for, but in our complex reality it is difficult to predict all the processes and factors that modify the decision-making process and its implementation. However, although the model is utopian and difficult to implement on the practical level, the more the decision-makers follow it, the better.

The basic assumption on which Simon and March (1958) rely when explaining their "satisficing" behavioral model is that the intellectual capacity of humans is limited when they explore the possibilities open to them in decision-making. The basic assumption of this model is that human rationality is limited and can only realize satisfactory solutions. The decision-maker has limited knowledge and ability that prevent him/her from arriving at the optimal situation. One may therefore conclude that satisfaction is a commendable achievement for decision-makers.

The "muddling through" (incremental) model (Lindblum, 1995), together with its basic assumptions, is based on agreement over former policy. It also stems from the limitations of the human factor regarding the knowledge and ability to predict the future. Moreover, decision-making in a pluralistic democracy is manifested through this model, the "good" decision being the decision agreed to by those involved (rather than the optimal decision that is the ideal of the rational approach).

The model proposes adopting the step by step method, i.e., a method that includes learning, drawing conclusions and gathering information that cannot be collected prior to implementing the decisions. Only thereafter, should slight change, agreed upon by all those involved in the decision-making process, be implemented.

The writer believes that the model is suitable for changes in the political decision-making environment, as demanded in this study.

The main differences between the three models can be summarized as follows:

	The rational model	The satisficing model	The muddling through model
Type of model	General rational	Limited rationalism	Maintaining policy with the addition of marginal change
Type of decision	Optimal, ideal decision for all parties involved	Satisfactory decision by decision-makers	Agreed decision amongst decision-makers

Another model that should be noted is that conceived by Saaty (1980, 1990) that is based on the analytic hierarchy process (AHP), a mathematical technique for decision-making based on several criteria.

In view of the need to provide solutions while preserving the interests of the citizens, the cellular companies and the local authorities, this author feels *the muddling through model should be recommended*, preventing disruption of the system but preserving the interests of the entire interest group in this system.

Nowadays, due to the minimization of the phones and their low energy consumption, the intention to distribute many antennae in a small relatively smaller area cell, the radiation emitted from the antennae and from the cellular phones themselves will be lower and will thus endanger public health less.

Technology, environment and policy

The background regarding radiation safety from base stations for cellular phone antennae is also discussed in the thesis. It is important to note that, in contrast to prior opinion, the denser the basic network of nodes, the lower the intensity of general transmission from both the transmission sites and from the cellular phones themselves.

Nowadays, due to the minimization of the size of a phone, their low energy consumption and the intention to distribute many antennae in a small relatively smaller area cell, the radiation emitted from the antennae and from the cellular phones themselves will be lower and will thus endanger public health less. The stringent safety charts determining the distance from buildings and for electro-magnetic radiation, as applied in Israel are based on strict international standards.

A description of the problem

The main problem is that citizens very much wish to use their cellular phones, as evidenced by the 423 million subscribers worldwide to cellular phones in the year 2002, a trend that will only rise at a rate of about 6% annually. At the same time, the NIMBY (Not In My Back Yard) phenomenon is familiar.

The city of Modi'in has particular problems as a completely new city under construction with a particularly high level of expectations by the citizens and city fathers. The incremental model for decision-making used by this researcher is thus employed to solve the problem. Decision-makers had to consider the demographic, planning background and the expectations of the political echelons when, as residents, planners, entrepreneurs and politicians, they were asked to determine urban standards for establishing a network of cellular phone antennae.

The main problem facing decision-makers is that in view of the citizens' high level of expectations, their public involvement, the planning and implementation standards and their expectations of a green city without ecological problems, the decision-makers are asked to make a decision that would seem in reverse of these demands, based on fulfilling the demands of the citizens and visitors to use their personal cellular phones. Towards the end of 1999, the head of the Modi'in local authority decided to raise the subject of cellular phone antennae to the public agenda. This writer was asked to head a team responsible for advancing the subject, and an outside consultant was appointed, expert in the field – the E.S.L Company for Environmental Quality and Acoustics with much experience in this field. The objective was to find advantages for distributing the transmission installations according to the principles noted that would assure:

- Radiation safety
- Unifying infrastructures
- Preventing visual damage.

The economic aspect should also be noted: In 2002, Israel's telephony market enjoyed an income of \$4.2 billion, of which 72%, i.e., \$3.02 billion went to four cellular companies. This indicates the economic interest embedded in both the domain of the cellular companies and of the local authority.

The research findings

The descriptive (field) study research method chosen here is compatible with the research objectives that aim to explore the connection between the variables. Similarly, surveys provide a basis for comparing the data and reduce to a minimum the researcher's impact.

The research sample was random and numbered 84 participants, of whom 71.4% live in Modi'in and 28 live elsewhere but work in the city.

The statistical analysis was conducted in several stages, using the SPSS analytic software. The study indicates that the level of use of cellular phones by residents of Modi'in and visitors to the city is moderate-high, due, particularly, to the youthful population. The level of awareness and fear of radiation regarding the concept of electromagnetic radiation are of a medium to high level. Knowledge of the actual locations of the cellular antennae is low. The lack of knowledge evidently generates a greater fear of electromagnetic radiation, hence the fear of cellular base stations.

The public clearly demands improvement in the decision-making process with greater consideration of the public interest, less consideration of the needs of interest groups, and is critical of the decision-makers in the local authority. In any case, the demand exists for improving the decision-making process.

To obtain further information in order to explore the subject from the decision-makers' perspective, this writer decided to interview four decision-makers in October 2003 – two of them public appointees and two employees of the local authority, one of whom was female. The focused questioning method was applied for the interviews (Nachmias and Nachmias, 1986), also known as the "non-scheduled, structured" interviewing technique.

Summary and discussion on the research process

The statistical data pertaining to the age of Modi'in's population and the results of the specific research clearly indicate its young age compared to that in other cities in Israel and globally, and the connection between the population age and the number of cellular phone users as a worldwide phenomenon. Hence the clear and notable need of the citizens to use their cellular phones, and, in direct context, the need of the cellular companies to install base stations is trivial. The series of interviews with the public appointees and municipality workers also illustrated the problem and the public dilemma stemming from it.

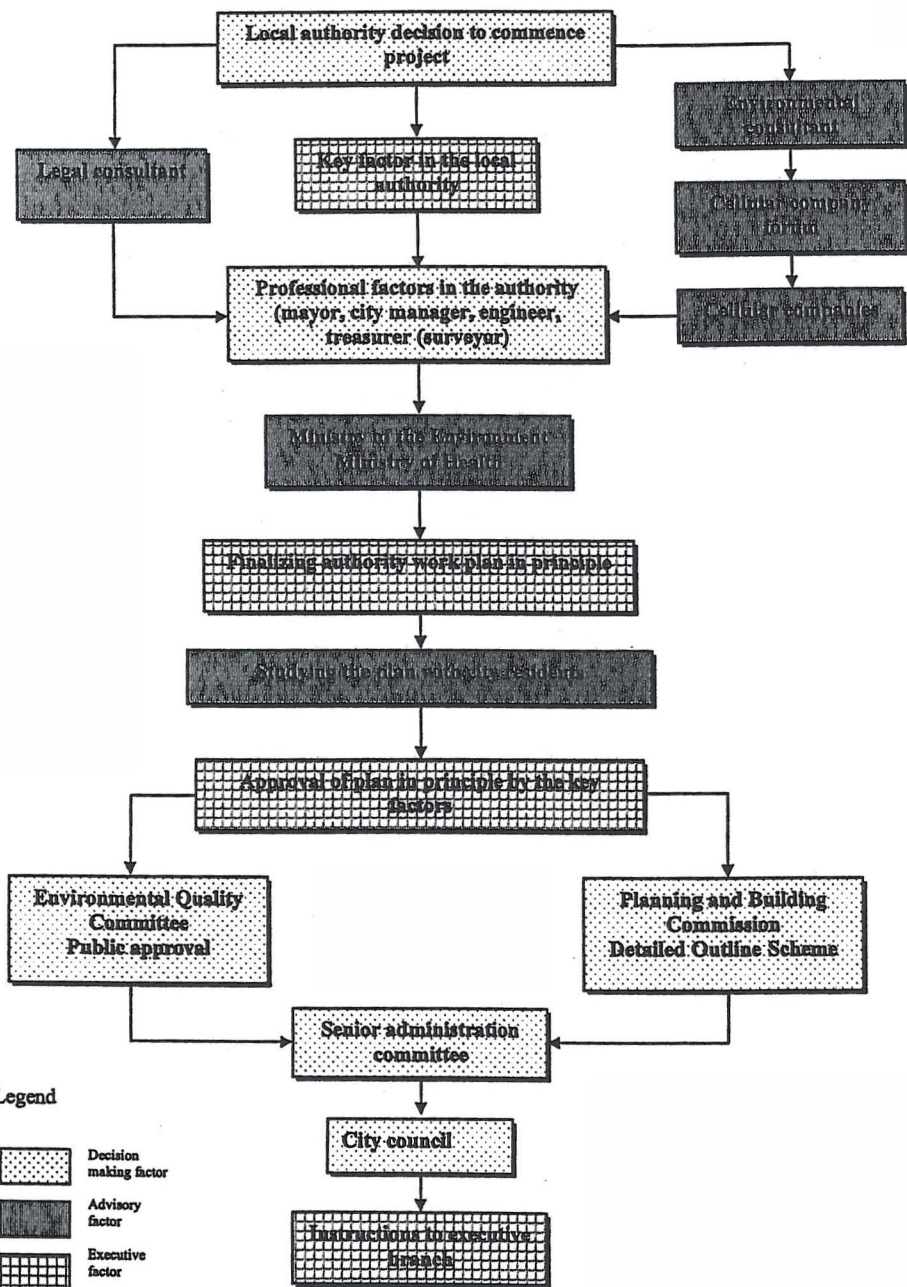
According to data from the Ministry of the Environment there are 5,674 cellular base stations as of October 1st 2003, a trend that will clearly grow. The same study noted an additional annual income of \$12,000 for the local authority from every such node. The distance to confrontation, alienation and anger between the residents is very short.

The plan was approved by the municipal Committee for the Environment and by the Local Planning Committee, and approved by the national Office of the Ministry of the Environment and by the city council.

Special attention was paid to the fact that electromagnetic radiation would be checked once a year, according to the stringent standards of the Israeli Ministry of the Environment. All the legal/statutory permits were obtained in mid-2001, after which the actual implementation was to be examined.

A workflow model (presented with a flow chart), demonstrating the algorithm followed in Modi'in was prepared, and corrected - with minor changes - for almost any decision-making model in the public sector, adapted to the relevant issues.

The decision-making model



List of Thesis Statements

1. This is crucial to separate roles of participating bodies when public decisions are to be taken. Cases alter when these bodies (local, national, etc.) have different level and scope of authority and/or influence on decision making parameters and the process itself. There should be greater cooperation between government (statutory) authorities at both the interest group and the individual levels for the public benefit.
 2. There is no magic formula existing that will lead to maximizing interaction between the government bodies in particular. Every case should be studied on its own merits, with the necessary intelligence and sensitivity. Models based on decision sciences theory frequently suggest an "optimal" solution, however in these socio-technical cases to make proper decisions needs rather more information on decision makers behavior than more mathematics.
 3. The research model shows that, in general, there is no alternative that can be considered a best alternative for all the participants in the "public game". One should strive to attain the second best alternative that will be accepted by most of the participants, will withstand the test of legal criticism and enjoy maximum legitimacy from the public. In this study, the incremental model presented here is found to be the best solution. Radical reform has no place, rather gradual, consistent, determined and focused change.
 4. The study finds that when individuals feel maximum transparency of the details, accept the decisions taken by the entity elected as legitimate and representative of their interests and find benefit for themselves, the chances that they will support them increase and they will even try to further them. This is even more correct if there is no opposition. The entity, as the organization furthering the decisions, is therefore responsible for creating maximum public cooperation in the decision-making process. This is true at the national level, and even more so at the local, municipal level.
 5. Several operative conclusions may be drawn from the research findings that will improve the decision-making process in the public sector in general, and in this case in particular. It clearly transpires that the public identifies the service it receives (whether from the private companies or from municipal elements in the case of this study), and can differentiate and examine the level of service provided.
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Further conclusions and advantages of using the model

1. The researcher discovered an essential need to increase cooperation between the statutory governmental bodies and both individuals and interest groups.
2. While collecting the data and writing this thesis I found that there is no magic formula that will lead to maximizing interaction between the government entities and the individual. Each case must be studied individually, intelligently and with the necessary sensitivity.
3. I have proven in this study that the groups cannot be related to as one entity but they must be segmented into sub-groups and each treated independently. Thus, for example, I have proven that individuals are more aware of the issue but are less critical of the decision-makers, hence they can be harnessed to the process more easily.
4. I have further concluded that there is no alternative that can be considered the best alternative for all the participants in the "public game". One should nevertheless strive to attain the second best, which will be accepted by most of the participants, will stand the test of legal criticism, and enjoy legitimacy from most of the public. In this study, the incremental model was found to be the best solution. There is no room for radical reform, but rather a gradual consistent, determined and focused change.
5. Furthermore, the issue of "second best" is even more important with respect to decision-making under pressure due to various constraints. I found that when decisions must be taken under pressure, decision-makers lack the luxury of exploring all the issues connected to each alternative (as is demanded by the rational model). They therefore take decisions according to heuristic strategies based on experience, such as elimination or lexicographic strategy. This directed me, of necessity, to explore the use of the incremental model that in fact proved itself.
6. According to this study - and based both on the findings and on the basis of my rich administrative experience - I believe that when the people accept the decisions taken by an elected body as legitimate and representing their personal interests, they are more likely to support this decision and even try to advance it, rather than to object to it. Thus the organization interested in advancing the decision is

even more likely to create maximum cooperation with the public in the decision-making process.

This is true at the national level, and even more so at the municipal, local level. The conclusions noted above were explored in this study at the theoretical and the empirical level.

However, the cultural differences between countries, and even between the different areas within one country, should be borne in mind, since they afford the basis for an appropriate model for cooperation and balance in decision-making for the specific area of research and for other areas connected to decision-making in the public sector. At the same time, one must remember that every decision and all cooperation are culture-bound, and therefore there are additional variables that are liable to affect the model.

7. The flow chart process model for decision-making that I developed, allows me to claim that it should be used for every topic that demands balance in decision-making between the public and the private sectors.
8. Beyond implementing the model successfully in the city of Modi'in, I have also applied it in the city of Ashdod of which I have been serving as a mayor since April 2004.

The debate over the damage from cellular transmissions has not ended. A study published by the Hebrew version the "Time" service on YNET notes that in recent years humanity has been exposed to the SARS crisis and to the Mad Cow disease. We have been warned of the use of cellular phones and dangerous chemicals around the home. Science can point to all the potential dangers awaiting us, but how can we, the worried consumers, supposed to cope with the glut of information and take intelligent decisions?

That study also noted the publication in April 2003 of a report by the Paris Agency for Environmental Health and Safety declaring that there is no health danger that can be attributed to cellular phones or to base stations. But one month earlier, the "Committee for Electromagnetic Fields" published a different report that stated that antennae are likely to cause sleep disturbances and headaches and damage the immune system.

The reaction of the Ministry of the Environment indicates that the Ministry is aware of the breaches and defects still existing in the law and plans to submit a proposal in the near future that will initiate a more rigid arrangement from the professional, as well as from the administrative,

perspective. It will include instructions regarding the establishment of sources of radiation and their maintenance and operation, and instructions for providing measuring services of the non-ionizing radiation and on licensing, enforcement, supervision, punishment and levies.

The cellular companies will not be those to check the level of radiation from the installations but will pay the Ministry of the Environment and supervisors on its behalf for this.

Similarly, the law will - for the first time - stipulate high fines for the cellular companies that transgress and will even take the company managers to court. It is absolutely clear that from the technological perspective, that innovations and discoveries are expected, and it will certainly be possible to further minimize both the cellular phones and the base stations, so that in the future, too, the technological issue will be explored to further improve decision-making.

I believe that ameliorating and upgrading the decisions is possible, as is sometimes conducted by organizational advisors in order to improve them and make them more effective. Same is needed, too, in this case, where constant improvement can be examined from the technological aspect.

From the perspective of community participation, absolute transparency *vis-à-vis* the public and providing better means for decision-makers to explore constant improvement in their decisions, are necessary to determine better and more efficient models for this and other domains.

The limitations of future research

1. The study was conducted in a new city with a population that enjoys an education far higher than the national average. This impinges on its awareness and involvement. The incremental model proposed and applied in the study must also be investigated in "older towns", whose population is closer to the national average.
2. The model was explored at the municipal level as regards an important topic close to the heart of every resident. Further studies should examine the subject at the national level and investigate the reliability of the model proposed here for both the issue of cellular antennae and for other issues that are not necessarily of great interest to the residents but none the less important.
3. When decision-making is critically influenced by ideology and not only by professional perspectives, concern should be voiced regarding the model's suitability.

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Igal Tzadok – Curriculum Vitae

Igal Tzadok is 51 years of age, married with three children and lives in the new city of Modi'in. After graduating from the Interdisciplinary Command College of the Israel Defense Forces in 1986, he received his B.A. degree in general studies from Tel Aviv University, an M.A. in public administration, specializing in local government, from the Bar Ilan University (near Tel Aviv) in 1990 and has recently completed his Ph.D. studies at the University of Pecs, Hungary. He has participated in many in-service training courses on administration, organization theory and interpersonal communications.

Igal Tzadok was a career officer in the Israeli Air Force, rising to the rank of Lieutenant Colonel before retiring in 1995. He held a variety of key jobs ranging from commanding the logistics department of food and economy for 5,500 people, in charge of the personal and community services for two air force bases through to marketing housing to career soldiers, participating in the accompanying decision-making process in the project administration and various other administrative positions.

In 1995 he became a department director for a manpower company, being responsible for some 830 employees in a variety of fields. From 1996-1998 he headed the Operations Department at the new city of Modi'in, establishing a network of services for the residents with an eye to the future growth of the city to 240,000 residents.

Igal Tzadok was thereafter the head of the engineering division at the Modi'in municipality, responsible for the engineering infrastructure, while supervising construction, gardening and landscaping, maintenance, business licensing, urban supervision, signposting and so on in that developing city. He was responsible for the implementation aspects in the local authority and coordinated the headquarters operations there.

From year 2000 to 2004 he served as a City Manager of the City of Modi'in, but has recently taken up his appointment as City Manager for the port city of Ashdod. He began lecturing on Public Administration at the Bar Ilan University in spring, 2006.

The candidate's activities during the research period

While doing the research work, participating in doctoral studies and writing his Ph.D. thesis Yigal Tzadok, in his capacity as City Manager of the new town of Modi'in, was involved in the following activities to name but some:

1. **Counseling and assisting** the previous executive manager of the Ministry of the Interior during the decision-making process on the subject of unifying local authorities in Israel.
2. **Responsible, as City Manager of Modi'in, for implementing the decision to unify local authorities, heading the city decision-making team on the subject until concluding the job there in March 2004.**
3. **Participation in the Modi'in Conference on Balance in Decision-Making (September 8-9, 2004) lecturing on "Location and Erection of Cellular Antennae Systems".**
4. **Working as an advisor to the Maale Adumim Municipality (with its 40,000 residents) while it was in the throes of a severe public dilemma over installing cellular antennae in the city center, until the issue was solved to the satisfaction of all the factors involved.**
5. **Currently head of the decision-making Task Force Group on:**
 - a. **Establishing a power station fuelled by natural gas in Ashdod, leading to an estimated saving of about 61% in the cost of electricity for night-time street lighting - an estimated saving of about 690,000 Euro annually.**
 - b. **Opening up the Ashdod beach front and converting it to a viable tourist initiative. (Project is estimated to cost about 9.5 million Euro).**
 - c. **Decision-making on positioning the city as one absorbing immigration and as the fifth largest city in Israel.**
 - d. **Locating cellular antennae system in the city**
 - **The principles pertinent to the city of Ashdod**
 - **Altering the location of specific antennae located next to a large school.**

6. The author lectured on January 26th 2005 at the conference of local authority heads, executive directors, treasurers and senior role holders on the subject of decision-making and the means to save energy. The Conference, in whose preparation he also participated was under the auspices of the Israel Union of Local Authorities and the Ministry of National Infrastructures where he presented the approach of the local authority heads and executive managers.

Publication activities

1. "Location and Erection of Cellular Antennae", Conference on Balance in Decision-Making (September 8-9, 2004, Modi'in, Israel).
2. "Balance in Decision-Making in the Public and the Private Sectors – A Model and its Application", *Independent Journal*, LAHAV-The Israeli Federation of Independent Organizations, April, 2005.
3. "Antennü Szotovoj Szvjazü v gorode: Problemü I Resenyija", Sputnik, 2004.9.9, Tel Aviv (in Russian).
4. "Decision Making in ICT Industry: A Cellular Telecommunications Problem I.", GIKOF Journal, NJSzT, Budapest, to be appeared in December, 2005 (in English).
5. "Decision Making in a Telecommunications Problem", Conference of Israel Union of Local Authorities, January 26th 2005, Tel Aviv (in Hebrew).
6. "Balance in decision-making between the public and the private sectors: The principle of public involvement in the administrative process". To be published.

