

Case Study and the Gap between Knowledge and Practice in Landscape Architecture

A Review on LAF's Experience

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Abstract | The "gap between knowledge and practice" is a known challenge. Especially in fields like Landscape Architecture and urbanism which are closely related to profession, this challenge has high priority. This gap has two main reasons in third world countries. First reason is about the production of knowledge which is unrelated to the needs of the country. Second reason is about the weakness in applying produced knowledge for practice.

In developed countries, this challenge is somewhat brought under control. In landscape architecture profession, LAF is one of the most known foundations which have programs to face this challenge. Although today we know that using an exact same program as a copy for a country like Iran is not necessarily useful, but as a part of a solution, their experience and program must be studied. So the main question of this paper is "what is the main program of LAF to bridge the gap between knowledge and practice? What is the role of "case study" on this program? In what areas, "case study" is useful?

Findings show that "case study" is the main core of LAF's "research" programs. This main core beside "scholarship" and "Leadership" programs of LAF produced six beneficial areas. These six areas are "Teaching", "Research", "Practice", "Theory building", "Criticism", "Communication and Outreach". This paper summarizes definition, benefits, limitations and a method for landscape case study which is proposed by Mark Francis for LAF.

Keywords | Case Study, Knowledge, Practice, Landscape Architecture, LAF.

Introduction | Nearly 50 year ago, Landscape Architecture Foundation (LAF) founded with the goal of bridging the gap between knowledge and practice to support the preservation, improvement and enhancement of the environment. As the world's population becomes increasingly urban and demands on natural resources more acute, landscape architects play an essential role in solving the complex, interrelated environmental, economic, and social problems we face today (<https://lafoundation.org/>). According to this LAF use case study as an inquiry and innovation strategy for the landscape Architecture profession to active its potential beneficial areas.

The Role of Case Study in LAF's Programs

Since 1966, a small group of landscape architects who were concerned for the quality of the American environment have proposed a four-point program to promote the relation of knowledge and practice. These four are "recruitment", "education", "research" and "a nationwide system for communicating the results of research, example and good practice". LAF continues to advance the body of knowledge and support innovative projects and initiatives needed through using three main programs. These programs are "Research", "Scholarship" and "Leadership" which their branches and details are shown in Diagram 1 (Ibid).

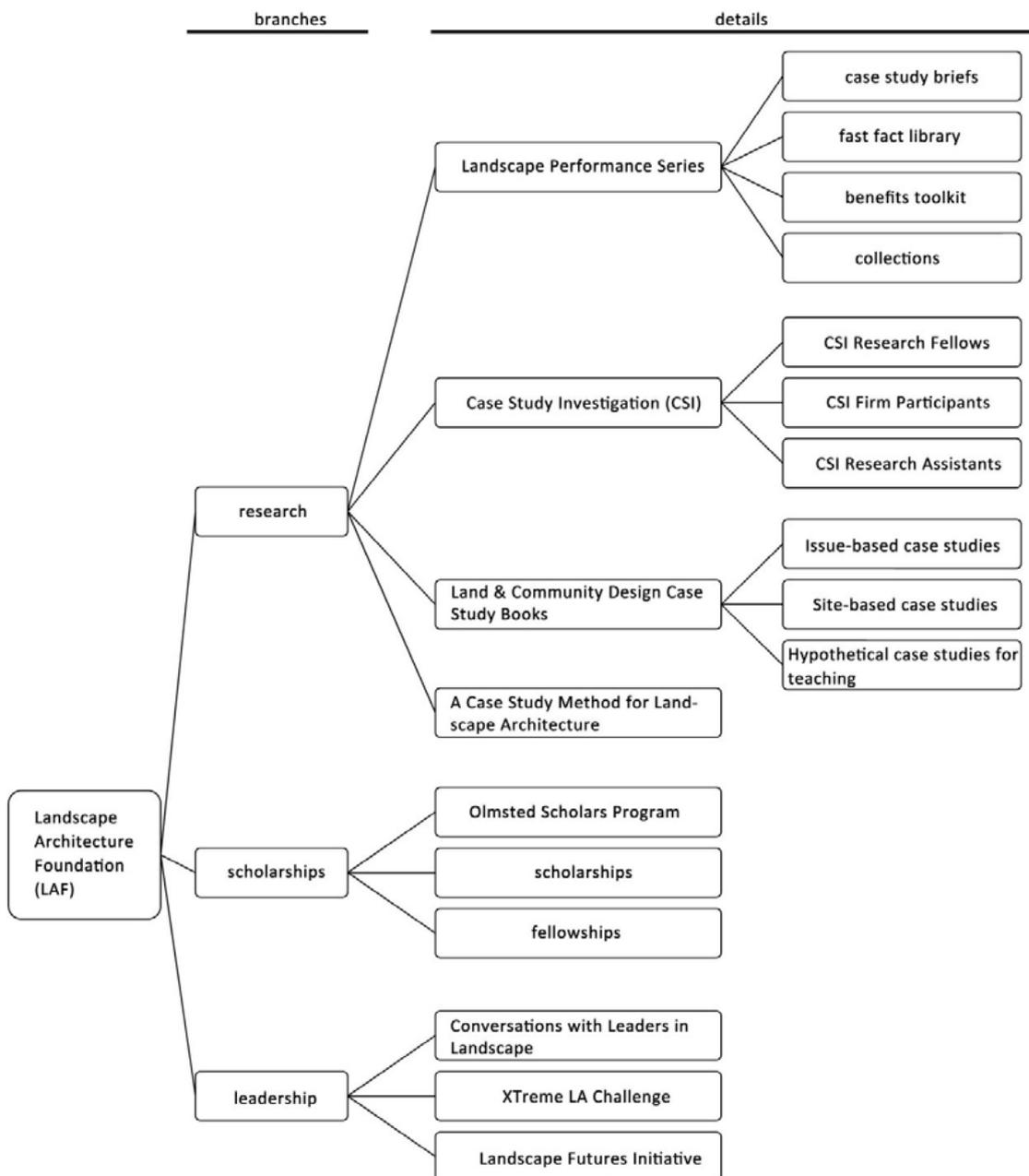


Diagram 1: Branches and details of LAF's programs.
Source: LAF,2016.

In "landscape performance series" of "Research" program, the findings of foundation as a useful resource are available through an online set. "Case study briefs" category is a searchable database of over 100 exemplary built projects with quantified environmental, economic and social benefits. "Fast fact library" category is a searchable collection of landscape benefits derived from published research. Each includes a citation and links to the full article. "Benefits toolkit" category is a searchable collection of online tools and calculators to estimate landscape performance. Some of these toolkits are "waste reduction model", "integrated calculation of ecosystems", "storm water calculator" and "I-tree Eco" which today they are about 25 cases. "Collections" category are themed highlights from the "Case Study Briefs", "Fast Facts", and "Benefits Toolkit", curated by leading thinkers in design, research, education, advocacy, and industry. "Case study investigation" as another branch of "research" program is a unique collaboration that matches "Research Fellows", "Firm Participants" and "Research Assistants" with leading practitioners to document the benefits of exemplary high-performing landscape projects though using case study method. So, this needs a "case study method for landscape architecture". Indeed LAF commissioned the development of "A Case Study Method for Landscape Architecture" to promote an in-depth, multi-dimensional approach to case studies and provide for uniformity in format and method. Until now in "land & community design case study books" LAF have published 5 books.

"Scholarship" and "Leadership" through using their branches as two other programs of LAF, support the research program which mainly relies on case study. These two programs organize the latest research on the one hand and exploring the pioneers and great professional experience in other hand. The result of this supported case studies publish in landscape performance series online set and books. Since 1986, LAF has invested \$2.6 million in research initiatives (<https://lafoundation.org/>).

So the structure of branches and details of LAF programs (table 1) show there is an integrated frame work which case study is its fundamental strategy of inquiry (Diagram 2). The LAF's case study method and its theoretical framework as a fundamental strategy to bridge the gap between knowledge and practice is important. LAF's case study method is a research project commissioned by LAF in 1997 which proposed in 1999 by Mark Francis (Francis, 1999).

Francis uses literature review and interviews to develop a case study method for landscape architecture. First, he reviews the past approaches to case study analysis in other professions and the social and ecological sciences, including a summary of the benefits and limitations of this approach. Second, he reviews how environmental design professionals have utilized case study for design through using an examination of research documents, Interviews with several leading researchers and practitioners and an electronic survey via some electronic Forum (Idem:8).

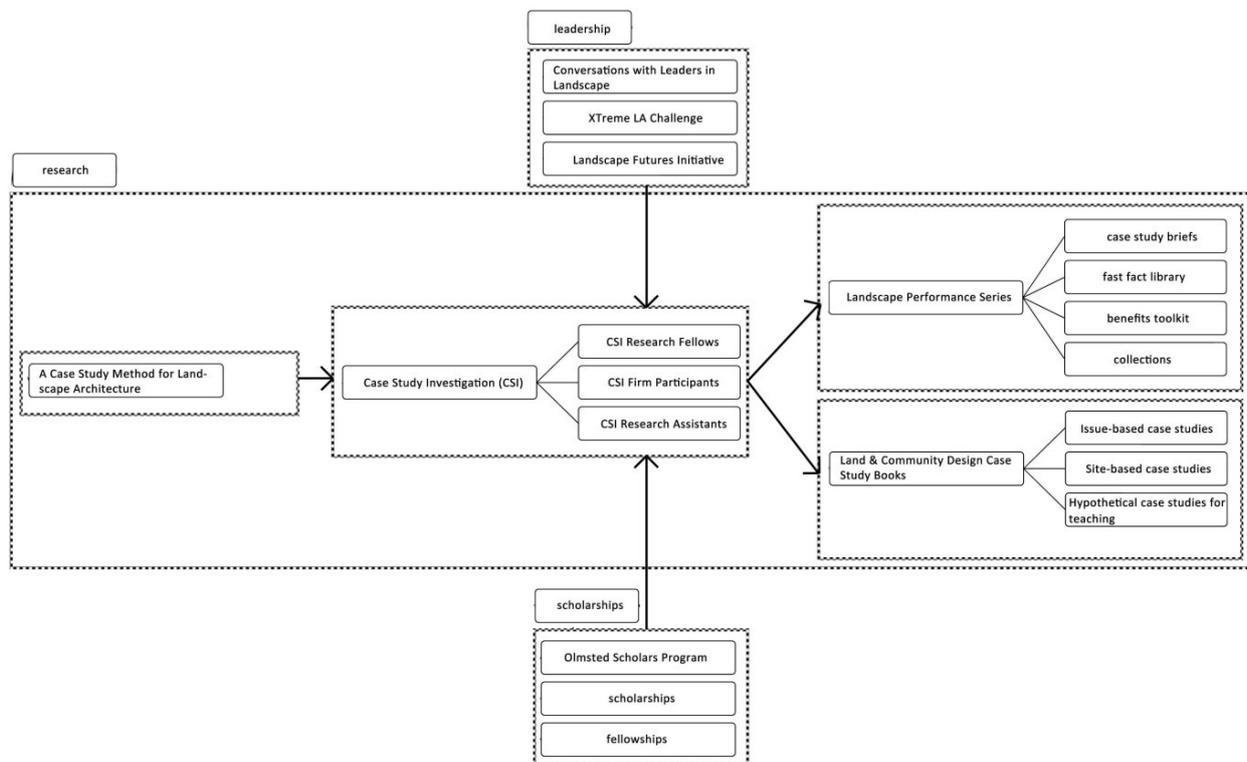


Diagram 2: LAF's integrated theoretical framework.
Source: Author.

What is Case Study?

The case study method has long been utilized in various professions and fields as an established method of education and research. Case study strategy as a real practice focuses on a setting or phenomenon which is embedded in its real-life context (Groat & Wang, 2013; Johansson, 2003; Francis, 1999; Deming & Swaffield, 2011; Yin, 1994). This strategy challenges students and practitioners to be effective problem solvers and devise solutions to common situations encountered in practice. Case studies often serve to generalize or purely anecdotal information about projects and processes. They also bring to light exemplary projects and their worthy concepts for replication (Francis, 1999: 8-11). While case study definitions have taken different forms, Francis proposes the following definition.

A case study is a well-documented and systematic examination of the process, decision making and outcomes of a project that is undertaken for the purpose of informing future practice, policy, theory and/or education" (Idem:9).

So Case studies for practitioners can be a source of practical information on potential solutions to difficult problems. For the profession as a whole, case studies are a way to build a body of criticism and critical theory and to disseminate the effectiveness of landscape architecture outside the profession (Ibid). Multiple case studies are looked at with an eye for generalizable lessons or principles that can advance knowledge. Case studies can be of exemplary projects, typical projects, contemporary or historic types (Idem: 10). Robert Yin suggests that case studies ability to retain holistic and meaningful characteristics of real life situations is their value (Groat & Wang, 2013; Johansson, 2003; Francis, 1999). So Case study is a particularly useful method in professions such as landscape architecture, architecture, and planning where real world context tends to make more controlled empirical study difficult (Francis, 1999: 13).

The History of Professional Case Study Use in Landscape Architecture

Since 1985 Landscape Architecture related fields have been carried out organized activities for develop case studies. The Urban Land Institute (ULI), the Lincoln Land institute, the Trust for Public Land, the American Planning Association, and the Urban Parks institute are just some of organizations which have documented details of more than 250 innovative and successful projects (Idem: 11-13,50). The University of Toronto's Virtual Landscape Architecture Library Inquiry Project, which includes over 160 case studies in landscape architecture, maintained by landscape architecture faculties, is a sample of similar to LAF's efforts.

While not always called case studies, documentation and dissemination of projects have been done since the days of Olmsted. Questions posed in case studies by Ian McHarg, Kevin Lynch, Herbert Gans, and Jane Jacobs 30-40 years

ago still form the basis for much contemporary thinking in environmental design. From these cases, new normative theory was developed. Some contemporary landscape architects use case study to develop and test their theories and design ideas. Just a few of these landscape architects are Rich Haag, Randy Hester, Ann Spirn, Ian McHarg, Carl Steinitz, Rob Thayer, John Lyle and Peter Walker. Furthermore there is recent expansion in the number of case studies, particularly those published by Process Architecture and Spacemaker Press in the United States. It is also important to notice that today, professional design awards are also a useful source of exemplary case studies (Idem: 17).

When discussing about case study it is essential to address the following single and comparative case studies (table 1) that make up a large part of the knowledge base as well as the popular culture of landscape architecture (Idem:17).

Case Study Benefits

Valuable benefits of case studies can be summarized in six general areas: "teaching", "research", "practice", "theory building", "criticism", and "communication and outreach" (Idem: 13).

Teaching: Landscape architecture today is predominately taught by example. Case studies are effective way to use examples in the classroom or studio (Francis, 1999; Delft University, 2016). Case studies are a useful way for students to use past projects in order to successfully design new ones. They are particularly instructive in teaching history and community outreach projects. Students can easily use case study method; so it is an excellent way to get them involved in research. Several courses have utilized case studies to teach theory in landscape architecture, particularly at Arizona State, Harvard, UC-Davis and Virginia (Francis, 1999:13, 14). In Iran, Some universities in addition to theatrical classes and design studios -which are known as traditional training methods- also use case studies for teaching. But definitions, objectives, strategies and related methods has not been developed in a scientific consensus.

Research: There is a large and well-developed literature which relies on case study method. Case study can be used in post occupancy evaluations, landscape ecology, site technology and historical analysis. Many academic dissertations are excellent examples of case study analysis. Some Organizations such as CELA, ASLA and EDRA report annually on advances in case study research to communicate findings to the profession (Ibid). Verses to the classic resources, today approximately all research methodology resources of architecture and landscape architecture has a debate on case study strategy, method and techniques.

Practice: Case studies are a structured way of recording projects. They are also a useful way for practitioners to evaluate the success and failure of projects, although few practitioners do this. Future practice can build on existing cases by understanding aspects of a project unique to a given

Table 1: Single or comparative case studies were cited as seminal to the theory and practice in landscape architecture.
Source: Francis, 18, 17 :1999.

single case study	comparative case study
Amelia island, Florida	American Society of Landscape Architects: 100 years, Simo. 1999.
Boston Commons, Massachusetts	Cities Reborn, Levitt, 1987.
Bryant Park, New York	City Form and Natural Process, Hough, 1984.
Camp Pendleton Study, California	Community Open Spaces, Francis et al., 1984.
Central Park, New York	Contemporary landscapes of the World, Kobayashi, 1990.
Easter Hill Village, Richmond, California	Design for Human ecosystems, Lyle, 1996.
The Franklin Delano Roosevelt Memorial, Washington, D.C .	Design with Nature, McHarg, 1995.
Gas Works Park, Seattle, Washing ton	Ecological Design and Planning, Thompson and Steiner, 1997.
Ghirardelli Square, San Francisco, Calif.	Gardens in Healthcare Facilities, Marcus and Barnes, 1995.
Green acre Park, New York	Great Streets, Jacobs, 1996.
Lovejoy and Forecourt Fountains, Portland, Oregon	Gray world, Green Heart, Thayer, 1994.
Manteo, North Carolina	image of the City, Lynch, 1961.
National Center for Atmospheric Studies, Boulder; Colorado	Modem Landscape Architecture,,Johnson, 1991.
Res ton New Town, Virginia	Modem Landscape Architecture: A Critical Review. Treib. 1993.
Plan for the Valleys, Maryland	The Death and Life of great American Cities, Jacobs, 1961.
Paley Park, New York	People Places, Marcus and Francis, 1997.
People's Park, Berkeley, California	Planning, Neighborhood. space with People. Hester, 1984.
Raleigh Greenway, North Carolina	The Politics of/ Park Design, Cranz, 1982.
Seaside, Florida	Public Space, Carr et al., 1992.
Seattle Freeway Park, Seattle, Washing ton	The Social Life of Small Urban Spaces, Whyte, 1980.
Stanford Campus Pl an, Palo Alto, California	Taking Measures Across the American Landscape. Corner, 1996.
Tanner Fountain, Harvard, Cambridge. Massachusetts	Urban Parks and Open Space, Garvin and Berens, 1997.
Vietnam Veterans Memorial, Washing ton, D.C.	Yard. Street. Park, Girling and Helphand, 1994.
Village Homes, Davis, California	
Washington Environmental Yard, Berkeley, California	
The Woodlands New Town, Texas	

context while gleaning principles useful in similar projects. Case studies can help replicate successes and avoid failures. Case studies can be helpful in demystifying what landscape architects do and how projects come together. They can be particularly useful in the design process as a way of engaging a variety of people in a complex process, moving from problem identification to creating a solution (Idem: 14, 15).

The performance of Iranian researchers in this area is weak and they limit their survey only for architecture in general. Some of the most known efforts are "contemporary architecture of Iran: 75 years of public building experiences" (2009), "Iranian contemporary architecture" (2009), "styles & concepts in Iranian contemporary architecture" (2013), "the hundred architects, hundred choice" (2015), " Contemporary Architecture Of Iran's Official Website" (2011). But there is no significant activity focused on Iranian contemporary landscape architecture. Indeed these efforts are only concerning about theoretical and historical aspects of case. They cannot make powerful relation between knowledge and practice especially in landscape architecture. Also in real practice, engaging people in design process through using case study in Iranian consultant engineering and employers is neglected.

Theory Building: case studies can not only describe but also explain and predict future action. Case studies can be used to develop what Kristina Hill calls a "strategic approach" or "rules of thumb" regarding landscape architectural projects from the scale of the site to the region. For example findings from case studies on pedestrian or park behavior can be used

to predict how activity may take place in similar projects (Ibid). In most academic disciplines due to their terms of educational and administrative structure, Case study like the "projective design strategy of inquiry" considered with no scientific validity and therefore denies it as an excellent research strategy. Furthermore in general, case study for theory building through using "scientific research" is more known than through using "design process or research".

Criticism: Any profession needs criticism for its development and progress. Case studies are a useful way to develop criticism in landscape architecture. They can illuminate both the positive as well as the more negative aspects of projects. Case studies can also inform the ongoing intellectual debate and critical discussion within landscape architecture (Ibid). Many of past case studies are lacking in-depth and critical review. There is also a lack of critical review in Iran, but also even more there is lake of seeing successes and constructive efforts.

Communication and Outreach: Case studies can report the results of landscape architectural projects in the media which are easily understandable by the public (Ibid: 15). For example, America Society of Landscape Architects release images of landscape architecture projects with a "designed by landscape architect" label to promote community (ASLA, 2015). Until now there is no obvious organized and targeted example in the communication and outreach activities of Iranian landscape architecture.

Case Study Limitations

Case study also has some limitations for landscape architecture. One of the most epidemic limits is difficulty of comparison across individual cases; especially when there are no comparable methods (Francis, 1999:16). While case study needs systematic methods, in landscape architecture, some designers consider taking pictures of built projects as a form of case study analysis while empirical and critical analysis is often missing. This failure, which decreases case study value, is also common in Iran.

Case studies are often costly, especially if they are done well with time spent on site. They can point out failures as well as successes of projects while professionals are often hiding this aspect. They are not so reliable on new projects. Projects are best evaluated after a decade or more.

As limitation on “the system of inquiry”, Case studies are not rewarding as much as “scientific” research. And finally as a

traditional limitation, case studies are mainly focused on very specially project like central park and there is a lack of more small and common projects like everyday natures, urban gardens and greenways (Ibid).

Proposed Case Study Method and Format

Case studies typically utilize a variety of research methods. These include experimental (Ulrich, 1984), quasi-experimental (Zube, 1984), historical (Walker and Simo, 1994), storytelling/ anecdotal documentation (McHarg, 1996) as well as multi-method approaches (Francis, 1999: 10). Case study typically involves "designing", "conducting", "analyzing the results", and "disseminating the results". Robert Yin says case studies can be done alone or together to compare across projects. Case studies in landscape architecture can be organized in several types like "type of project", "type of problem", "geographical region", or "designer". Each type has its own unique purpose and benefits.

Abstract/Fact Sheet	Full Case Study	In-depth Analysis
Photo(s)	Project Name	Archival research (project records, newspaper articles, etc.)
Project Background	Location	Awards or special recognition for project
Project Significance and Impact	Date Designed/Planned	Copies of articles or reports on project
Lessons Learned	Construction Completed	Interviews with client
Contact	Cost	Interviews with managers and maintenance people
Keyword	Size	Interviews with users
	Landscape Architect(s)	Interviews with nonusers
	Client	Longitudinal studies of the place over time
	Consultants	
	Managed by	
	Context	
	Site Analysis	
	Project Background and History	
	Genesis of Project	
	Design, Development and Decision Making Process	
	Role of Landscape Architect(s)	
	Program Elements	
	Maintenance and Management	
	Photograph(s)	
	Site Plan(s)	
	User/Use Analysis	
	Peer Reviews	
	Criticism	
	Uniqueness of Project	
	Limitations	
	Generalizable Lesson	
	Future Issues/Plans	
	Bibliography of Project	
	Citations/References	
	Web Sites/Links	
	Contacts for Further Information	

Table 2: There levels of case study analysis.
Source: Francis, 21 ,20 :1999.

Table 3: Proposed parts and questions of case study format.
Source: Francis, 1999: 20, 21.

row	part	question- explanation
1	Baseline information/context	location, size, client, designer(s), consultant(s), density, land use type, etc.
2	Role of key participants	Landscape architect? Other professionals? Client? Users? What is the nature of the team? Who leads the team? Their role in beginning of project? How has this changed during course of project?
3	Financial	Initial budget? Final costs? Reasons for any difference?
4	Process	Political process? Decision making process? Design process? Implementation Process? Who influences a project's decisions and outcomes? Why? How does project come together?
5	Problem definition and response	What problem(s) is the project trying to solve? Was it solved? If so, how? If not, why not? Were other problems solved?
6	Goals	What are key goals (social, ecological, aesthetic)? How set? Who defined them? Did goals change during course of project? If so, how?
7	Program	How was program developed? Who developed it? Was it modified during course of project?
8	Design	Key design concepts? Inspiration for form? How did designer translate goals into form?
9	Site visit(s)	What does the project look like? How does it work? How does it feel?
10	Use	How is the place used? Who uses? Does not use? How? Scale relationship to similar projects?
11	Maintenance and management	problems of management and maintenance? Maintenance costs? Perception of project by space managers?
12	Perception and meaning	How place is perceived and valued?
13	Scale	Size of Project? Dimensions of key elements? Amount of site coverage and impervious surface?
14	Time	How well does the place fare over time? How does project age incrementally?
15	Unique constraints	How were they addressed in process?
16	community	How is the community served by this project? Social impact? Meaning?
17	Environmentalsensitivity and impact	How is the environment served by this project? Contribution to sustainability?
18	Impact on profession	How is the profession served by this project? What does it contribute to the professional knowledge base?
19	Infrastructure	Underlying challenges of site? Technology constraints?
20	Lessons learned	Place specific versus more generalizable lessons learned?
21	Theoretical underpinning	Why project was done? Question(s) it is trying to answer? Problem(s) it is trying to solve?
22	Outside critiques	By awards jury? Experts? Users? Review committees? Design critics? Journalistic reporting? Has there been any controversy associated with the project? Has this been resolved? If so, how?

Who actually should do the case study is an important methodological issue. In the design and carrying out of the case study objectivity must be insured. Only if other people such as academics and journalists are involved in preparing the case study, Subjectivity can be avoided. The person or team that prepares the case study needs to be free of bias and skilled in asking questions, listening, and comprehending the type of place and issues involved (Idem: 21).

Most successful case studies utilize a variety of methods such as the Site visits, Site analysis, Historical analysis, Design process analysis, Behavioral analysis, Interviews with users and non-users, Archival material searches, Bibliographic searches, and Web searches. It is important for method to be systematic and consistent in using the methods (Ibid).

Correlating to the purpose of the case study, the results that

were obtained through the use of systematic methods can be provided on at least three levels. The first, and simplest, is a "project abstract" in 2-4 pages. The second is a "full project case study". The third is "in-depth" case study with more contextual information (table 4). Each level has a different application. In teaching, more detailed case study at the second and third level is needed (Ibid).

In Francis proposed case study format although some findings are unique for a specific project context but it is also useful for knowledge and practice in general (Francis, 1999; Francis, 2003). The main parts and questions of proposed case study format are shown in table 3. Furthermore, Francis proposed several ways base on "typology" and "issue typology" to organize case study analysis (table 4).

Table 4: Proposed typology and issue typology of organising case study analysiss.
Source: Francis, 1999: 22, 23.

orgnising type	exampels
typology	Campuses .Cemeteries .City Plans .Community Open Spaces .Gardens (Private) .Gardens (Public) .Greenways/Parkways .Historic Landscapes .Housing Environments .Institutional and Corporate Landscapes .Landscape Planning .Metropolitan Open Spaces .National Forests .National Parks .New Community Design .Plazas .Recreational Areas .Regional Plans .Restored Natural Landscapes/Reclamation .State Parks .Streets .Urban Parks .Waterfronts.
issue typology	Approaches to community participation .Design decision making .Development costs .Low cost urban parks .Use and users .Meaning .Park management and maintenance .Permanency in community gardens.

Conclusion | Review of "LAF's program structure" which is to "bridge the gap between knowledge and practice" shows that "case study" has a fundamental role in it. LAF's point of view -which leads to use case study strategy- derived from concept that says "outstanding new projects can result from putting a new twist on ideas from the past". To perform this concept, LAF asked "Mark Francis" to research and propose a method for integrated approach for targeted case studies. In proposed case study method documentation, teaching and research are available. These abilities which categorized in six areas will advise and help experts and non-experts to hypothesis testing, theory building, naturalistic generalization and synthesizing a case. Indeed case study beyond an instrument for creating

article is a fundamental inquiry strategy for developing knowledge and its relations to practice and communication which can use in pragmatic professional institutes.

So LAF's programs testify "the high capacity of case study", which is neglected in Iran due to the lack of theoretical framework. Although in Iran using the term of "case study" is common and also used in a variety of fields and in different ways; but cause of "framework less efforts", it appears passive and superficial. So, as Iran needs to produce endogenous and native knowledge, case study which considers complex real-world as source for knowledge, can be consider as an important pragmatic active strategy.

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