Teaching Note

Networks and Public Management

If as a discipline we are to "treat networks seriously" (O'Toole 1997), students of public administration need to be well versed in the theory, practice and methods of studying networks operating in the public sphere. The proposed course discussed here is targeted towards Master of Public Administration students, but could be scaled down for an undergraduate public administration course, or augmented for a Ph.D. level course. Likewise, this course would be appropriate for students in a Master of Public Policy program.

Summary of the Teaching Strategy
Berry et al. (2004) identified three traditions of network research: public management networks, policy change and political science networks, and social network analysis (SNA). Of the three, the field of public administration is most familiar with the first two. With the exception of the work done by Provan and Milward (1995, 2001, 2005) who draw on both the public management and SNA traditions, SNA is absent from the academic writing of the discipline. This is unfortunate because, as Provan and Milward (2005) argue, SNA is a powerful tool for strengthening community partnerships. Furthermore, Durland and Fredericks (2005) show that SNA is useful for studying program evaluation, and in the management literature, SNA is already well established as a strategy for organizational development (Cross and Parker 2004).

Social network analysis differs substantially from traditional statistical techniques typically taught in public administration programs. Rather than assuming independence, as is the focus of multiple regression analysis, SNA assumes that individuals/organizations in networks are interdependent. Furthermore, regression analysis focuses on attributes, while SNA focuses on

relationships. Consequently SNA can be a powerful tool in and of itself, or it can be used to generate measures that can be used with other statistical techniques. The most commonly used SNA software package UCINet is easy to learn and use, and is affordable for students.

Summary of the Course's Themes
In terms of the substantive themes regarding public sector networks, the following topics will be covered:

- Network as a unit of analysis—Networks have both formal and informal aspects, can be intra- as well as inter-organizational
- Deciding when collaboration is appropriate
- Role of networks in policy implementation
- Network governance structures
- Network design
- Network leadership
- Strategies for network management
- Trust in networks
- Power in networks
- Information/knowledge sharing in networks
- Network evolution, networks as complex adaptive systems
- Evaluating network effectiveness
- Role of information technology in networks

Therefore, the foci of this course are to integrate the questions concerning networks with management strategies for those who are "managers of" or "managers in" (Milward and Provan 2006) networks and to equip students with a tool for diagnosing network problems. Upon successful completion of this course, students should be well-versed in network theory, the practical issues of working in networks, and the methodological approaches available for studying networks.

Explanation of the Course's Teaching Methods
Many instructors make the mistake of either letting a text guide the design of a course or start with a series of interesting activities and try to build a syllabus from them. The problem with these approaches is that they do not focus on what the goals of the course should be. Therefore, in the development of this syllabus, I am using a process called backwards design (Wiggins and McTighe 1998). Backwards design begins with development of the learning outcomes for the course, proceeds to the identification of what the acceptable evidence would be to determine if students achieved the learning outcomes, then finishes with the activities that will be used to get students to the learning outcomes.

Using this process, I have identified the following learning outcomes for the course. By the end of the course, students should be able to:

1. Identify the pressing public sector network questions, from the view of practitioners as well as researchers. These questions are normative (Should we be using networks? How

should we evaluate network effectiveness?), descriptive (Can we classify the types of networks that are in use?), explanative (Why do networks result in specific outcomes? How do networks emerge?) and prescriptive (What should managers of and managers within networks do to make networks operate more efficiently?).

2. Have a working knowledge of the public administration literature as it relates to these types of questions.
3. Be able to differentiate between formal and informal networks and between inter-organizational and intra-organizational networks.
4. Understand the role that networks play in the implementation of public policy.
5. Use social network analysis as an analytical tool for evaluating networks.
6. Evaluate networks for effectiveness by using various network diagnostics.
7. Develop their own personal networking capabilities.
8. Understand the limitations of networks, a "network perspective" and social network analysis.

In order to determine that students have achieved these learning outcomes, they will be assessed in the following ways:

1. A written report will require students to situate a real-life network problem within the literature on public sector networks; identify both the formal and informal aspects of this network; identify whether it is an inter- or intra-organizational network; identify the role that the network plays in implementing public policy; and identify limitations of the networking approach.
2. The written report will contain the results of a social network analysis for which the students designed a survey instrument for data collection, implemented the survey, used UCINet to analyze the survey data, and presented relevant sociograms for the network studied.
3. The written report will also describe the network diagnostics and interventions utilized by the students to identify and solve network problems, respectively.
4. Students will present the results of their project and be evaluated on the written report and presentation by both the professor and a representative of the organization/network for which they conducted their analysis.
5. Students will complete weekly assignments related to the learning objectives as an ongoing assessment.

The final step in the backwards design process is to identify the activities that will allow students to achieve the learning outcomes. A week-by-week overview of learning objectives, possible class activities/assignments, and the readings concludes this document.

An important part of the learning strategy for this course is a service learning project. Service learning allows students to put their knowledge and skills into practice. The service learning project that is incorporated into this course requires careful planning and oversight by the instructor. Before the semester starts, the instructor should have identified a network (which may be inter- or intra-organizational) for study *and* secured their full support for the project. Because social network analysis requires at least an 80% response rate, it is vital that the

instructor meet with the network participants to ensure that there will be adequate participation when the time comes to administer the SNA survey. If the instructor is having difficulty finding a suitable network for study, he/she could consider modeling the relationships within the MPA program itself by using either the faculty or students as subjects. If the instructor chooses this option, he/she may want to incorporate a "community of practice" perspective.

Another critical aspect of the learning process involves the use of computers in the classroom. Weeks 5 – 6 and 9 – 13 require that students have access to computers with UCINet loaded onto them. These classrooms should be equipped for presentation by the instructor so that he/she may demonstrate the use of the concepts/software. Students then complete in-class activities using the software. I encourage the use of groups for the in-class activity so that students are able to learn from and teach each other the skills that they will be using for their homework assignments.

Required Texts
In terms of the assigned readings for the class, I have used a combination of text books and journal articles. The books I choose provide an overview of public sector interorganizational networks (Agranoff's *Managing within Networks: Adding Value to Public Organizations*) and intraorganizational networks and the use of social network analysis (Cross and Parker's *The Hidden Power of Social Networks: Understanding How Work Really Gets Done in Organizations*). The Cross and Parker text has excellent appendices which provide a sample SNA survey and "Tools for Promoting Network Connectivity"—a series of diagnostics for networks. In addition to these two texts, students will download a free online text by Hanneman and Riddle that provides a excellent overview of social network analysis and the use of NetDraw and UCINet, the social network analysis software used in this course. Several chapters of the Hanneman and Riddle text conclude with Review and Application Questions which can be used for in-class discussion/activity or as part of the weekly assessments. These texts will be supplemented with journal articles that illustrate the theory and practice of networking.

Grading
The recommended grading scheme for the course is to grade a portion of the weekly assessments and to assign a grade for the final project. Additionally, because discussion is an important part of the learning process, I recommend evaluating and grading both the quality and quantity of classroom participation. Therefore, grades could be allocated as follows:

Weekly Assignments (6 of the 13 assignments at 10% each)	60%
Final presentation	15%
Final written document	15%
Participation	10%

Assignments: Assignments are made every week in order to assess whether or not the students have achieved the learning objectives for that week. Instructors are encouraged to conduct these weekly assessments even if they do not all result in a grade. Because much of the

learning in this course is cumulative, it is important for students to master the concepts before attempting to move on to the next. Therefore, the assignments represent important "check-ins" with students. Assignments may be done in-class or as take-home assignments, and as either individual or group assignments. Instructors are encouraged to vary the format of assignments as student learning styles differ from student to student. Instructors should treat these weekly assignments as a formative assessment, using the results to make course adjustments, not simply to evaluate students' performance.

Final Project/Presentation: The final project/presentation is a cumulative assignment for which students have incorporated the input from the instructor from the weekly assignments from weeks 10 – 13. The final written document may be an individual or group endeavor and should make recommendations to the network that was the subject of the service learning project. A final presentation of these results is scheduled for the last week of class.

Weekly Overviews

Week 1
In this first week of class it is important for students to understand why it is important to study public sector networks and what is meant by a "network" compared to other forms of organization. As means of introduction to network as a form of organization, the article by Podolny and Page (1998) compares and contrasts networks, markets and hierarchies. While taking a private sector approach to the concept, the issues brought up by these authors resonate with public sector forms of organization as well. Keast et al. (2004) provide a more specific discussion of the characteristics of networks. Bogason and Toonen (1998) situate the study of networks into an international perspective on public administration theory while O'Toole (1997) outlines both the practical and research agendas concerning public sector networks in the U.S. He stresses the importance of studying networks because of their central role to the implementation of public policy. Finally, Cross and Parker (2004) argue that the "network" perspective is useful not only in studying inter-organizational networks, but also the formal and informal aspects of intra-organizational networks. Comparing these two perspectives can lead to a discussion of "network as a level of analysis."

Over the next week, as an assignment (Network List I), students will create a list of 10 networks, describe the role of these networks in the implementation of policy, and be able to identify those characteristics that make these arrangements networks, rather than another form of organization. In order to complete the assignment, students may find examples of public sector networks on the internet or through journal articles.

The primary activities to achieve the learning objectives for this week are in-class lecture and discussion. However, instructors may want students to begin the homework assignment as an in-class activity.

Week 2
Having defined what networks are and their importance to policy implementation, this week's

focus is on the structure and function of networks. Milward and Provan (2006) and Agranoff (2007) present network typologies based on the function of networks. Milward and Provan also discuss three types of network structures. Graddy and Chen (2006) identify those factors influencing the size and scope of networks designed for social service delivery. Cross and Parker (2004) describe both the structure and function of various intra-organizational networking arrangements. Network structure will be revisited during weeks 4 – 5 of the semester.

Using the networks chosen for last week's assignment, students will describe the function and structure of each using the typologies presented (Network List II). This can be done as either a take home or in-class assignment. In-class lecture and discussion are the other activities designed to meet the learning objectives.

Week 3

A distinguishing characteristic of networks is that there is no one "in charge." This presents some concerns both for the management of networks as well as the implementation of public policies through network structures. Agranoff (2007) covers both of these issues and Provan and Kenis (2005) discuss governance implications for managers within networks.

As an in-class or take-home assignment, students will discuss the management issues of their identified networks as well as the larger policy accountability issues (Network List III). In -class lecture and discussion are the other activities designed to meet the learning objectives.

Week 4

This week represents a transition from learning about networks to the study of networks and the introduction of a new modeling technique—social network analysis. Up to this point, networks have been presented as "whole networks" for which all network members are known in advance. Another way of studying networks is to start with an individual or organization and identify those individuals or organizations with whom the ego interacts. Additionally, roles within networks are identified by Cross and Parker. Network structure is reintroduced in an article by Milward and Provan (1998) and social network analysis and its utility in improving collaboration is introduced in an article by Parker, Cross and Walsh (2001). The language of social network analysis and an explanation of how social network analysis differs from standard statistical approaches to studying networks is presented in Hanneman and Riddle (2005). Finally, students will be introduced to sociograms.

Students will complete Assessment 1: Personal Network Diagnostic from Appendix B in Cross and Parker (2004) as their assignment for the next class. Since this is more of an activity than an assessment, instructors are encouraged to use the Review and Application Questions at the end of Chapter 3 of Hanneman and Riddle as a part of an in-class assessment. Students may work individually, then "grade" each others papers. Instructors can facilitate this process and identify those concepts that may be causing difficulty for the class.

Week 5

Now that students are familiar with what networks look like when in the form of a sociogram and the terminology associated with social network analysis, they will be introduced to the more technical aspects of modeling networks. Each student must have at his/her disposal a

computer with UCINet software. Up to this point, students have been envisioning network diagrams, or sociograms. Students will use the NetDraw component of UCINet to create these sociograms and be able to display attributes of nodes. Underlying these graphs are data matrices called sociomatrices. Sociomatrices can be created in UCINet directly, or brought in from Excel. Chapter 5 of Hanneman and Riddle (2005) presents some basic matrix algebra and Chapter 6 deals with data handling.

Using a sample data set, students will create sociograms and sociomatrices and practice some data permutations. Sample data sets and many other useful resources can be found on the International Network for Social Network Analysis web page (http://www.insna.org/). Instructors will use a sample data set to illustrate the concepts and use of NetDraw and UCINet. Chapter 5 of Hanneman and Riddle provides both Review and Application Questions concerning matrix algebra. Students will practice in class with one data set and have a take home assignment using a separate data set (Using NetDraw and UCINet I).

Week 6
The primary learning objective for this week is to apply social network analysis to network development in the public sector. Provan et al. (2005) explain how SNA can be used to strengthen community partnerships, introduce some concepts for diagnosing network problems, and present a sample SNA survey. Chapters 7 – 8 & 10 of Hanneman and Riddle (2005) cover the topics of connection, distance, centrality and power.

Using a sample data set, students will analyze the connectivity, distance, centrality and power aspects. As with last week, instructors should demonstrate the concepts and use of UCINet and students should use one data set as part of an in-class learning activity and another for their homework assignment (Using UCINet II). Instructors may also use the Review and Application Questions for Chapters 7 and 10 in Hanneman and Riddle to structure in-class discussion and activity.

Week 7
Now that the students have had a chance to be introduced to the basic theoretical concepts of public sector networks and the methods for studying them, it is time for them to apply their skills and knowledge to a real-life case. The objective of this week's course is to develop and implement a social network survey. Unfortunately, like all service learning projects, some of the information you wish students had before engaging with outside groups comes later in the semester. Therefore, although the topic is creating a SNA survey, students don't have all the knowledge they need to complete this task. Consequently, students should draw heavily on the surveys presented in the Cross and Parker text and the Provan et al. (2005) article from the previous week. Students, with a great deal of guidance from the professor, will discuss which aspects to include in the version to be used. Additionally, an important topic to be considered when collecting SNA data is its ethical use. Because SNA data are necessarily not anonymous, informed consent procedures must address this condition. Anyone conducting a SNA project must work closely with the network being studied to ensure that no harm comes from participation. The readings by Borgatti and Molina (2005) and Kadushin (2005) explore the ethical issues in greater detail.

The assignment for the next week is to get Human Subjects approval on the SNA survey.

In class activities include a lecture and discussion of the ethics of social network analysis and the development of the survey itself. The survey developed by the students should take into account the topics for the remainder of the course: communication, information/knowledge management, power, trust, leadership, expertise, and management.

Week 8
This week is devoted to the topic of network effectiveness. The learning objectives include understanding when collaboration is appropriate, what we mean by "effectiveness", and methods for studying effectiveness. Chapter 8 of Agranoff contributes to this discussion by asking whether networks "add value" to the administrator, participating organizations, network processes, or network outcomes. Similarly Provan and Milward (2001) consider network effectiveness from the community, network and organization/participant points of view. Both Provan and Milward (1995) and Choi and Brower (2006) provide empirical examples of network effectiveness and use social network analysis.

The assignment for next week is a continuation of the service learning project and not an assessment of this week's learning objectives. Over the next week students must collect and enter the data from the service learning project.

Because the assignment isn't related to assessment of this week's learning objectives, the instructor should construct an in-class assessment on the topic of network effectiveness. This could flow from an in-class activity based on the sample networks used during Weeks 2 – 4. Other activities for this week include lecture and discussion.

Week 9
Now that the data have been collected, the course turns to the ways in which the data can be used to diagnose network strengths and weaknesses. The first topics covered involve communication and information/knowledge management. Chapter 7 of Agranoff discusses the role public networks can play in managing knowledge. Cross et al. (2001) consider knowledge creation as well, but from an intraorganizational perspective. Finally, Pardo et al. (2006) analyze communication *about* the implementation of information technology in the public sector.

The assignment for next week assesses the learning objectives for the week and contributes to the final project. The assignment is to create sociograms with NetDraw for each relationship for which data were collected, displaying relevant attributes. Students should discuss what the sociograms tell us about communication and how information and knowledge flow within the network.

Students may begin the assignment in-class. Other in-class activities include lecture and discussion.

Week 10
This week continues the discussion of network strengths and weaknesses and focuses on the issues of power and trust. The importance of trust in networks is discussed by Edelenbos and Kiljn (2007). They provide several testable hypotheses concerning trust in networks. Chapter 6 of Cross and Parker also deals with trust, but offers specific strategies for building trust among collaborators. Power in networks is often overlooked. Moore (1992) discusses gender

in state government and the impact of formal versus informal roles. Students should be encouraged to consider how both formal and informal relations affect power within networks and the role that gender, race, and other factors may have power. Additionally, the relationships between power, trust, communication, and information/knowledge management should be considered.

The assignment for next week is to examine centrality and how it relates to power and trust within the network. Students will use UCINet to compute the relevant network indictors.

In-class activities should begin with a presentation of the assignment due this week. Lecture and discussion about power and trust should flow from the presentation. The class should come up with questions/hypotheses regarding power and trust that are stimulated by this discussion that become part of the homework for the following week.

Week 11
This is the third week of the discussion of diagnosing network strengths and weaknesses and focuses on the issues of expertise and leadership. Eglene, Dawes and Schneider (2007) discuss authority and leadership patterns in knowledge networks and present several testable hypotheses. Harris and Clements (2007) use social network analysis to examine the role of expertise in the implementation of public health emergency plans. As with the previous week, the assignment due should be presented, and a discussion of how expertise and leadership affect the interpretation of the results should follow. Likewise, questions generated by the discussion can be incorporated into next week's assignment.

The assignment for next week is to analyze the sociograms and output from last week's assignment in light of the concepts of expertise and leadership.

Week 12
This is the final week for discussing network strengths and weaknesses and focuses on the management of networks. Agranoff (2003) provides an excellent overview of all of the topics covered this far in light of the management of networks. Similarly, Chapter 10 of the Agranoff text relates to lessons learned about managing in networks. Chapters 7 & 8 of Cross and Parker summarize many key concepts and pose many questions about the future and limitations of network analysis. As with the previous weeks, the assignment due should be presented, and a discussion of the implication for management should follow. Likewise, questions generated by the discussion can be incorporated into next week's assignment.

The assignment for next week is to analyze the sociograms, output, and insights from the last two weeks' assignments in light of the concepts of management.

Week 13
This semester has focused largely on networks for a snapshot in time. However, networks evolve and change over time. Suitor, Wellman and Morgan (1997) discuss "how, why and when networks change" while the other two articles by Anderson (1999) Morel and Ramanujam (1999) present a new theoretical framework, complexity theory, which I find useful for understanding both intra- and inter-organizational change. The objective of this class is to get students thinking more broadly about change and the role networks play in the constant evolution of the public sphere. The in-class activities to achieve this objective are lecture and discussion.

The assignment for this week is to create a presentation for next week's class for the service learning network and a final recommendations document.

Week 14
Presentation of service learning project

Supplemental Texts for Instructors
Degenne, A., & Forse, M. (1999). *Introducing social networks.* London: Sage.

Durland, M.M., & Fredericks, K. A. (eds.) (2005). *Social network analysis in program evaluation.* Hoboken, NJ: Wiley Periodicals, Inc .

Kilduff, M., & Tsai, W. (2003). *Social networks and organizations.* London: Sage.

Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications.* Cambridge: Cambridge University Press.

Wiggins, G.P., & McTighe, J. (1998). *Understanding by design.* Alexandria, VA: Association for Supervision and Curriculum Development.