
Case Analysis

Conflict Management in Public–Private Partnerships: The Case of the London Underground

Denise Currie and Paul Teague

Public–private partnerships (PPPs) have become common inter-organizational arrangements associated with “new public management.” Discussion about their effective operation has often focused on successful management methods, with less discussion about how these arrangements specifically overcome obstacles and problems. In this article, we seek to address this deficiency in the literature by analyzing the conflict management system employed within the London Underground PPP (when it was still in operation). We conclude by identifying several lessons from this case that we believe should inform the design of such systems, one of which is the role of knowledge management.

Key words: conflict resolution, conflict management, public-private partnerships, public policy disputes, inter-organizational relationships, public transit, London, railroads.

Introduction

“New public management” (NPM) is a term that encompasses government policies that seek to modernize the public sector using market-oriented

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management and a cost-efficient agenda that seeks to reduce the tax impact of public sector projects. How to create new types of organizations for the improved design and delivery of public services in the twenty-first century has been a key focus of NPM (Hood 1991; Farnham and Horton 1996; Osborne 2006; Pollitt and Bouckaret 2011).

Such organizations can involve an assortment of inter-organizational arrangements varying from principal-agent contracts with for-profit and non-profit organizations, to more complex inter-organizational collaborations (Bilodeau, Laurin, and Vining 2006). Many analysts of such organizations have typically argued that the spread of these new organizational forms will herald liberation from the “dead hand” of public sector monoliths. But more astute observers have recognized that delivering public services through a plurality of unorthodox organizational forms brings its own challenges (Osborne 2010; McGuire and Agranoff 2011).

Providing public services through arrangements involving multiple interdependent actors raises complex questions. What is the most appropriate governance framework to govern such inter-organizational relationships? Will lines of responsibility and accountability not become overly complex when multiple actors are involved in the delivery of a public service? How can we evaluate such inter-organizational arrangements? Can effective teams be created when their members are dispersed across different organizations that demonstrate power asymmetries? (see Heinrich and Lynn 2001; McGuire and Agranoff 2011).

Fostering collaborative arrangements between inter-organizational units and networks is widely seen as critical to making these new entities work effectively (Huxham and Vangen 2005; McGuire 2006; Hall and Kennedy 2008; Agranoff 2012). But it would be unwise to suggest that such collaborative arrangements will ensure that these new organizations will not face both strategic and operational problems (Schrujijer 2008; McGuire and Agranoff 2011). Uniting public, private, and non-governmental organizations with diverse objectives, cultures, and management practices is likely to create difficulty and generate conflict (Gray 2004; Jones and Noble 2006).

Thus, we would expect managing conflict to be a critical element of implementing such partnerships, but few scholars have focused on the role of conflict management in the operation of these kinds of organizations. Within the field of inter-organizational relations, many scholars have acknowledged the importance of conflict management in some form (see, e.g., Gray 1989, 2004, 2006; MacNeil 1978; Powell 1990; Mohr and Spekman 1994; Gulati and Singh 1998; Schrujijer 2008), but few have considered specifically what would constitute an overall effective conflict management system for inter-organizational arrangements.

In this article, we seek to help redress this gap in the literature by examining the functioning of a conflict management system in a PPP. These

partnerships are characterized by cooperation between private parties and the public sector, mainly through contract, to deliver public services, although levels of involvement and risk taken by the private party can vary widely (Chen, Hubbard, and Chen-Sung 2013).

In this article, we analyze the conflict management system of the London Underground (LU) PPP. London Underground is the public train rapid transit system for the city. Its PPP arrangement involved partnerships with three separate private asset management companies: Tubelines Limited, Metronet Rail SSL Limited, and Metronet Rail BCV Limited; the latter two are managed together by a dedicated contracts management alliance made up of four major shareholders. This partnership serves as an optimal setting for this kind of study because it was one of the most ambitious PPP arrangements within the United Kingdom at the time it was operational, between 2002 and 2010.

Public–Private Partnerships

Public–private partnerships are designed to improve the effectiveness and efficiency of public services by leveraging private sector investment and expertise (Akintola, Beck, and Hardcastle 2003). For the most part, they are implemented to upgrade infrastructure, whether it is to improve roads and transport services or to build new schools or hospitals. Governments use PPPs to meet increased demand and expectations for public services with greater ease and efficiency than normal procurement procedures. These partnerships vary in terms of the level of private involvement and the allocation of risk, but are often characterized as durable (see Hodge and Greve 2007, which describes different PPP types). Consequently, payments to private partners are typically spread over a relatively long time, which allows public money to be released for alternative projects.

The claimed benefits of PPPs are not only fiscal, however. Trefor Williams (2003) examined the arguments in favor of these arrangements. These arguments include: such arrangements facilitate the transfer of knowledge and capabilities predominately from the private sector to the public sector; and the private sector possesses stronger managerial expertise and greater creativity that encourage innovative activities and ensure that projects operate efficiently, within budget, and on schedule. In addition, proponents argue that such skills are deficient in the public sector, which has resulted in ineffective, even disastrous, management of public projects; PPPs, according to this reasoning, address such deficiencies (Williams 2003).

Some researchers are unpersuaded by such arguments, suggesting instead that PPPs do not deliver value for money (Connolly and Wall 2008). The merits of these respective arguments are beyond the scope of this article. But it is important to note that many governments have heavily encouraged the use of PPPs, and the presence of these arrangements has

increased dramatically across many countries. Their increased use has spurred a range of novel hybrid organizational arrangements, which can be a challenge to manage because the operating logic of the public and private sectors are quite distinct.

On one hand, the private sector is oriented toward achieving returns on invested funds, taking business risks, anticipating market and competitive developments, and realizing a corporate goal. On the other hand, the public sector tends to focus more on legislation, regulation, political opinion and influence, democratic decision-making processes, the minimization of risks, and realizing social goals (Reijnen 1994).

Intricate PPP contracts have been developed to accommodate these diverging public sector and private sector interests. Contracts often stipulate incentives and performance standards, and also apportion risk. Incentives are an important tool for aligning interests. Private sector partners are given incentives to encourage innovation and efficiency and to meet the objectives set by the public sector partner.

Apportioning risk is also a critical aspect of the PPP contract. Generally, within PPPs, the risk associated with completing and maintaining a project is transferred to the private sector. The private partners, who the proponents of PPPs regard as better equipped and experienced to deal with risk, are more likely to realize a profit if they manage the project's risk appropriately. By transferring this risk to the private sector, the public sector is less likely to be financially disadvantaged if the project overruns or if unexpected problems arise.

Although the PPP contracts are designed to establish incentives, performance standards, and risk allocation in advance, with the aim of aligning interests and objectives, misconceptions and disagreements about the administration of such contracts arise frequently, which can lead to conflict. For example, ambiguity can arise about responsibility for particular risks, and parties may disagree about contract terms that stipulate performance standards. These disagreements are typically not isolated one-off events — contracts in general are usually incomplete, which can lead to uncertainty over the intent and interpretation of any contract (Williamson 1979). Contractual uncertainty can breed disputes.

Disputes may not be limited to contractual issues, however. Day-to-day work across the PPP organizational interface is likely to give rise to other problems. The private and public sectors often have different methods of working and have different organizational cultures, which can cause friction. For example, a lack of cross-organizational knowledge sharing may arise, causing misunderstandings and disagreement between partners. The political context of the PPP may also hinder its effectiveness — successive governments over the life of the partnership may manage it differently. Finally, the requirements and demands of third parties such as financiers and insurers may also change, which can disrupt the partnership.

Conflict Management in Public–Private Partnerships: An Analytical Framework

Although PPP contracts seek to align interests and objectives to avoid conflict, they normally also include comprehensive conflict management arrangements to ensure that disputes and problems are addressed in an orderly manner. As a result, conflict management provisions are an integral aspect of nearly every PPP.

A conflict management system is a set of interrelated procedures that can be used separately or together to settle disputes (Rowe 1997; Conbere 2001). Effective conflict management is normally regarded as resting on four key pillars, which are outlined in Table One.

Values and Beliefs

The first pillar relates to the values and beliefs underpinning the system (Rowe 1997; Lynch 1998). Usually, conflict management procedures are organized along a continuum from cooperative to adversarial interventions. Cooperative conflict management techniques seek to engage parties in consensus-based processes that are sensitive to their respective rights and interests and which empower them to jointly resolve their differences, with an emphasis on achieving mutually satisfactory, win–win solutions to disputes without recourse to contracts or litigation.

By contrast, adversarial conflict management techniques focus more on rights-based matters that usually involve determining whether contracts have been breached in one way or another. The outcome is normally win–lose with little emphasis on preserving cooperative relations. Dispute systems experts have argued that effective conflict management systems should be comprehensive, but priority should be placed on collaborative problem solving, with rights-based processes only brought into play as a last resort (Costantino and Merchant 1996; Rowe 1997; Slaikeu and Hasson 1998).

Structure and Roles

The second pillar of a conflict management system relates to the development of appropriate institutional administrative and decision-making structures. Several common rules guide the building of conflict management structures (Ury, Brett, and Goldberg 1988; Costantino and Merchant 1996; Rowe 1997; Lynch 1998; Slaikeu and Hasson 1998). One is that institutional arrangements should encourage disputes to be resolved as close as possible to the point of origin. Another is that the process should include an integrated multilayered series of steps that address the dispute appropriately. A third is that institutional arrangements should resolve disputes in a manner that secures the continuity of business relationships. A fourth is that the different conflict management structures and roles should be transparent and easily accessed. Finally, the necessary resources — staff,

Table One
The Four Pillars of Conflict Management

Values and Attitudes

Belief in the possibility/desirability of resolving conflict

Tolerance and respect of others and their positions/views

Belief in the feasibility/desirability of collaborative outcomes

Balanced orientation between consensus-based and rights-based approaches

Acceptance of systematic approaches to conflict management

Value placed on improving relationships

Willingness to champion effective conflict management

Behavior and Skills

Communication skills and behavior

Situation assessment and conflict analysis skills

Resolution strategy design skills

Advocacy skills — collaborative problem solving, and negotiations

Third party collaborative skills — conciliation, facilitation, and mediation

Decision-making skills — deliberative, administrative, and adjudicative

Structure and Roles

Appropriate roles and personnel

Appropriate administrative procedures and rules

Appropriate decision-making systems

Appropriate institutional arrangements and structures

Appropriate resource and resource allocation systems

Procedures

Availability of a range of conflict management approaches and procedures

Selection and implementation processes for appropriate procedures

Effective implementation of conflict management steps in a comprehensive manner

Effective implementation of appropriate sequences of procedures

time, and money — should be made available to ensure that the conflict management architecture functions effectively. Beyond these core principles, the institutional complexion of conflict management systems can vary greatly as firms seek to customize arrangements to match the idiosyncratic nature of their businesses.

Procedures

The third pillar is procedures. A range of approaches and procedures should be used to solve disputes. Most importantly, the design of procedures should ensure that the conflict management system is embedded in the core principles of procedural justice in which decision making and procedural rules are fair, predetermined and preannounced, transparent, and consistent (Thibaut and Walker 1975).

Skills and Behaviors

The fourth pillar relates to the skills and behaviors necessary to make the conflict management system work effectively — highly competent problem solvers are more likely to obtain a settlement that is satisfactory to all the parties of a dispute (Ury, Brett, and Goldberg 1988; Mitchell and Banks 1996). Thus, a core requirement is that relevant employees not only know what their conflict management responsibilities are, but they have also been trained in problem-solving techniques. They should also have strong behavioral and social skills (i.e., good communication and persuasion skills). These skills foster an informal dimension to a conflict management system that allows conflicts to be resolved promptly and close to their point of origin without the need to evoke formal procedures.

The four pillars outlined above provide an analytical framework for examining conflict management systems. But the design of such conflict management systems may become more challenging in the context of inter-organizational arrangements such as PPPs. Conflict management systems are normally housed within single organizations and are often associated with addressing such internal problems as employee–employer conflict.

Creating effective conflict management procedures within one organization is challenging enough; it becomes even more demanding within such inter-organizational arrangements as PPPs. To begin with, the organizational glue that solidifies these procedures within single enterprises is likely to be missing, or at least not as strong. Conflict management procedures must straddle more than one organization, which increases coordination costs. Different organizations may have different existing approaches to conflict management that may be difficult to integrate within a single system. Varying commitments across organizations may cause problems: for example, not enough resources or training may be devoted to conflict management by particular organizations, which may impair the operation

of the whole system. Developing common conflict management values may be tricky because organizations may have contrasting ideas about trust, cooperation, and mutuality. Evaluating the operation of the system is the only appropriate way to detect and correct defects, but doing so when numerous organizations are involved is challenging.

Developing conflict management systems that serve effectively the interests of inter-organizational relationships such as PPPs may be particularly challenging, but such systems are important to the successful operation of these arrangements.

Methodology

Because separating a conflict from its context can be difficult (see Costantino and Merchant 1996), we undertook an in-depth case study, collecting extensive qualitative data using semi-structured interviews. Conflict management within the context of inter-organizational relationships and specifically in PPPs has been relatively under-researched. In addition, the studies that have been done in this area have largely ignored how conflict management works in practice, and have instead focused mostly on quantitative methods that examine the incidence of conflict, the causes of conflict, and the incidence of when certain resolution techniques are used (Druckman 2005). In comparison, a single case study method using qualitative data enables a close examination of the parties' attitudes and behavior and why the relationships between the involved parties took the particular forms they did. It also provides a better opportunity to identify the strengths and weaknesses of the conflict management system by placing it in the context in which it operates, particularly with regard to how and why disputes occur.

Qualitative data, particularly in relation to conflict situations, will be inherently subjective, but they support gaining a more comprehensive understanding of the phenomenon than any "objectively" measured outcomes obtained through other approaches (Druckman 2005: 7). Thus, we believe that a single case study approach designed to uncover and identify the issues and challenges associated with conflict management systems within a PPP, which can richly describe the nature of the phenomenon in question (Siggelkow 2007), is a welcome addition to the literature.

We conducted extensive interviews with managers from the relevant PPP parties between February and October 2007. We interviewed contract managers, directors, performance managers, and those who held the title of "knowledge manager" from each of the three organizations involved: the LU, Metronet, and Tubelines, as well as the LU legal director and a commercial advisor from the PPP arbiter's office (an external and independent position, whose role was to ensure value for money across all PPP contracts). The interviews explored broad themes, including the arrangements

for resolving disputes; the degree of conflict and type of disputes; the roles of people involved in resolving conflict; the degree of communication, trust, and collaborative relationships; and the role that knowledge management, culture, and leadership has in the effective management of conflict. The interviews lasted up to an hour and a half in most cases, and individuals offered detailed insights and examples. We transcribed each interview, and, using an open coding technique, we analyzed the data to determine common factors and themes, which were then categorized to permit comparison. We coded responses according to their relevance to the main research areas as discussed above.

In addition to conducting interviews, we examined government reports and internal organizational documents that we obtained from interviewees. To enhance validity, we corroborated these data with the qualitative interview data. We engaged in a rigorous process of interpreting the data in alternative ways by using what Barry Turner (1981) has called “axial” coding, which allowed us to review and re-sort the data into sub-categories and establish linkages and relationships.

We note that we undertook this research when the PPP was still fully functioning. At the outset, LU entered into three separate PPP agreements, one with Tubelines in December 2002 and two others with Metronet in April 2003. In July 2007, however, Metronet subsequently went into administration, a form of bankruptcy in which the Metronet companies continued to operate as a “going concern” under an administrator (an interim chief executive) who acted on behalf of creditors while options were sought short of liquidation. The outcome was that Metronet was then placed under the control of Transport for London (TfL), the public agency that manages all public transit in London, at the beginning of 2008. Tubelines continued to operate within the PPP agreement until its major shareholders were bought out by TfL in June 2010. This effectively brought back all asset management in-house to TfL and ended the PPP agreement.

According to a National Audit Office report issued in 2009, Metronet failed for a number of reasons. The report blamed problems with internal governance, risk management, and meeting financial obligations. Within this report, the National Audit Office (NAO), which is responsible for carrying out value-for-money audits into the administration of public policy, recommended that changes be made in the PPP arrangements with Tubelines in light of the lessons learned from the Metronet failure, which culminated in the acquisition of Tubelines by TfL (NAO 2009). Analysts have attributed the failure of the PPP to several governance, contractual, and risk management issues, and although we explore these briefly below, a detailed discussion of these issues is beyond the scope of this article, the purpose of which is to examine conflict management in an operational PPP.

London Undergroup Public–Private Partnership

London's railway infrastructure, which is one of the oldest in the world, spreads across London, serving up to three million passengers daily. The "tube" or "underground," as it is commonly known, has expanded considerably over recent decades.¹ The expansion of the underground was welcomed by many Londoners, but it meant that less priority was subsequently placed on upgrading older lines. By the late 1990s, some lines, particularly the Northern Line, were in desperate need of refurbishment.

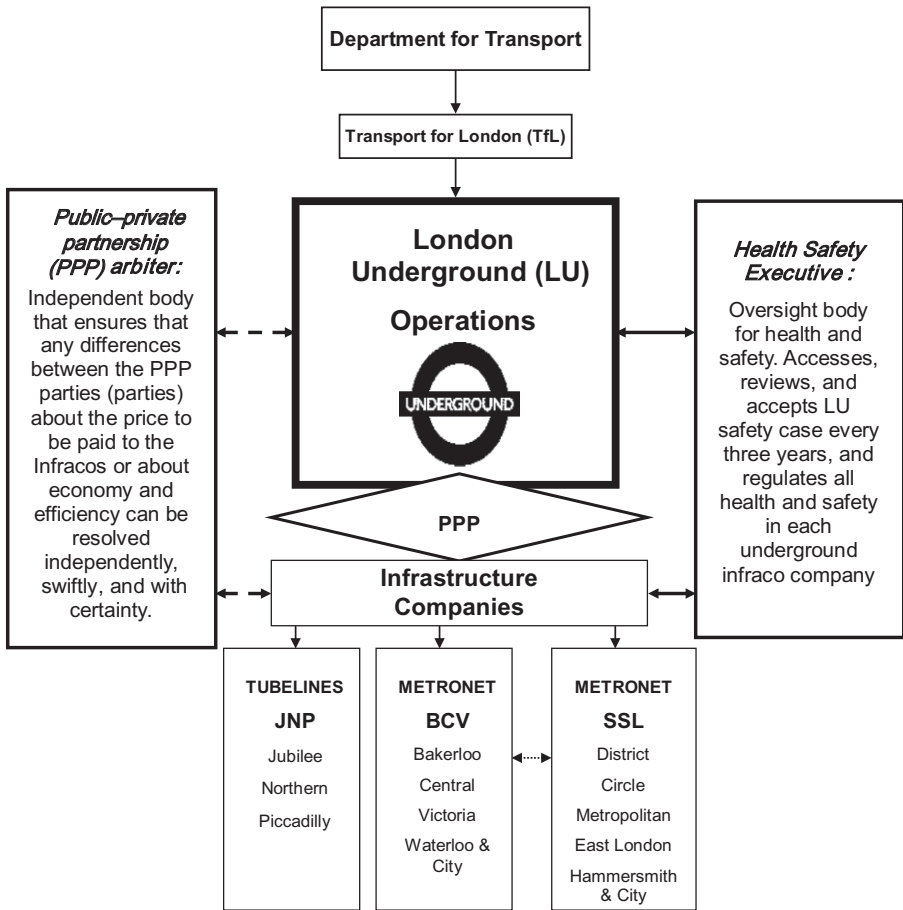
Although large-scale upgrading was needed, the government had serious reservations about the capacity of the various organizations responsible for running the underground (LU, London Regional Transport,² and the Department of Transport) to effectively manage a modernization program because of problems with previous projects. For example, in 2001, the project of the Jubilee Line extension finished two years behind schedule and hundreds of millions over budget, and the Central Line upgrade in the 1990s had also been plagued by delays and excessive costs. As a result of these deep reservations, and after exploring a number of options, the government of the United Kingdom established a PPP arrangement to oversee the future management and operation of the underground. The government's rationale was that a PPP arrangement would meet its objective of improving the underground through private finance while also safeguarding public interest and guaranteeing value for money.

As documented in various studies, arrangements for PPPs can vary widely (Hodge and Greve 2007; Brinkerhoff and Brinkerhoff 2011). Graeme Hodge and Carsten Greve identified five different "families" (or versions) of PPPs — the version the UK government favors mostly involves "long term infrastructure contracts that emphasize tight specification of outputs in long-term legal contracts" (Hodge and Greve 2007: 5; see also Osborne 2001; Berg, Pollitt, and Tsuji 2002; Ghobadian et al. 2004; Grimsey and Lewis 2004). Indeed, this definition was used to develop the LU PPP: private companies adhered to an output-based contract that was to run for thirty-three years.

Output-based contracts were used to align the performance of the private companies to the desired outcomes of the LU. For example, LU stipulated how long a journey from one station to the next should be and then it was up to the private company to achieve that goal. Methods could include upgrading or improving trains or installing better rail tracks. The PPP arrangement comprised three separate output-based contracts, which are outlined in Figure One.

London Underground was split horizontally into four separate companies: the infrastructure companies ("infracos") to oversee three sets of designated tube lines, and an operating company, LU. The infracos were leased to private companies under the thirty-year PPP contract, but operations remained with LU, the publicly owned body that retained the freehold

Figure One
The London Underground PPP



(Adapted from NAO 2004b).

of the system (the associated land and property) as well as the responsibility for safety and employing train drivers, station staff, and line and network controllers. Tubelines won the contract labeled JNP (Jubilee Northern Piccadilly); Metronet obtained the contracts for the other two lines, Bakerloo Central Vitoria (BCV) and Sub-Surface Lines (SSL).

The role of the independent PPP arbitrator was to determine whether the infracos had realistically and accurately priced the PPP contracts by comparing their figures and plans against a “notional infraco,” for example, a theoretical model based on a fictional company developed in accordance with

best practice by the PPP arbiter. The arbiter's role was designed to be most pivotal during periodic reviews, which were planned to occur every seven and a half years when contracts were renegotiated. The arbiter also gave advice on whether any emerging requirements were obligations of the existing contract or represented additional obligations when new contract terms were required. His or her role was also to adjudicate whether unanticipated events would require price revisions to those established in the contract.

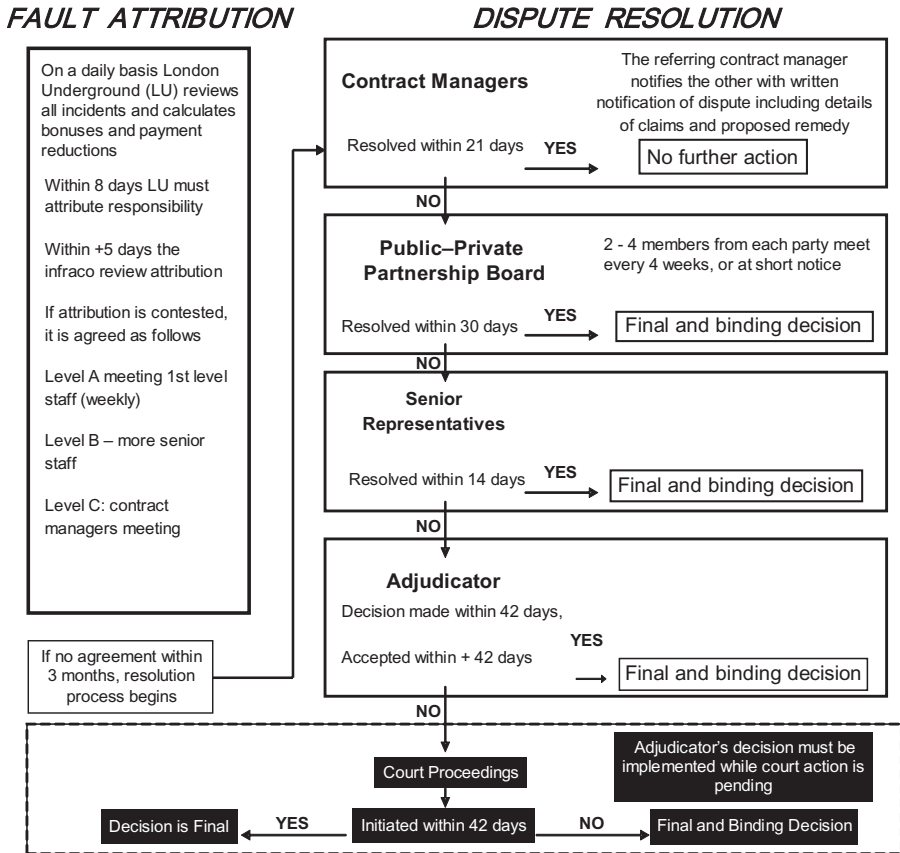
The LU PPP featured three common characteristics of PPPs in general: the transfer or sharing of risk; monitored performance standards; and competition or incentive-based regulation (IMF 2004). First, the private organizations took responsibility (and assumed the associated risk) for all assets relating to maintenance, replacement, and upgrade of trains, stations, signaling, track, tunnels, and bridges. London Underground retained responsibility for operating functions such as scheduling, revenue collection, signal operating, marketing, and employment of drivers and station personnel.

Second, the PPP also included appropriate performance targets and benchmarks. The objectives of the private organizations were to achieve specific levels of performance for the day-to-day operation of the transit system, meet benchmarks for the conditions of assets, and meet obligations for the replacement and renewal of assets (NAO 2004a). The contract called for measuring these objectives in areas of capability, availability, ambience, and fault rectification.³ The private organizations also had contractual obligations relating to good corporate performance, long-term investment, and the timely completion of modernization projects. In return for meeting these specific performance targets and contractual obligations, the infracos would receive 1.1 billion pounds approximately in "infrastructure service charges" every month.

And lastly, the contract incentivized private organizations to exceed performance targets and benchmarks: if they managed risks appropriately, the infracos would gain more revenue by gaining increased infrastructure service charges.

The LU PPP was an intricate and complex contract that consisted of an extensive suite of documents for each PPP infraco. Great effort was made to write the various documents as explicitly and coherently as possible. In anticipation of the PPP, LU restructured its organization in 1999 to imitate the PPP arrangement, which highlighted many contentious and ambiguous issues that needed to be addressed in the contract. Unsurprisingly, however, when the contract was "live," further contentious areas were identified. Problems included the interpretation of particular standards: disagreements emerged over who should be attributed with a fault in performance; disputes occurred because different parties interpreted a contractual term differently; changes in contract requirements

Figure Two
The Architecture of Dispute Resolution in the London Underground Public-Private Partnership



(Adapted from NAO 2004a)

caused disagreement between the parties. Thus, because there was considerable potential for conflict, the PPP contract established a comprehensive dispute resolution system.

The Architecture of Conflict Management within the Public-Private Partnership

Two core features of the PPP's architecture for conflict management were the fault attribution process (FAP) and dispute resolution agreement (DRA), which are illustrated in Figure Two. These procedures were introduced to

address a range of potential disputes including disagreements about operational issues, commercial and contractual disagreements, performance issues, and disagreements about the allocation of risk.

Fault Attribution Process

The FAP sought to address day-to-day operational issues that specifically affected the infracos' performance outcomes. Figure Two shows that a step-wise process was used to address disputes. If a dispute was not settled at the initial review stage, it was referred to progressively higher levels of management at Levels A, B, and C. Timeframes for the resolution of a dispute were prescribed for each stage before the problem was escalated to the next level. Operational incidents ranging from signal failures that cause service disruptions to track defects that cause speed restrictions occur daily within the LU. Because of such incidents, infracos often failed to meet prescribed performance standards, which allowed LU to reduce the infracos' expected income.

The process of determining responsibility for a particular operational incident was clearly a source of conflict, which needed proper management to avoid escalation. The FAP was designed to enable LU and the infracos to resolve operational incidents in a mutually satisfactory manner (Figure Two).

Our research found that, as the PPP became more established, disputes arising from operational incidents were usually resolved at the review stage: in these cases, parties normally understood clearly why the incident occurred and who was accountable. But complex problems relating to contract interpretation that involved more sensitive commercial issues or a lack of clear available information required the involvement of senior management or staff with specialized commercial and technical knowledge. These issues escalated to higher levels of management within the FAP.

The contract performance information database (CPID), accessible to both infracos and LU, is at the center of the FAP. The infracos could view the faults attributed to them on the system and agree or disagree with the report. Disagreement arose if there was ambiguity over the circumstances that caused the incident. For example, a signal failure risk was apportioned to the infracos, but it may actually have been the fault of an LU driver who went through a red light or pressed the wrong button. Where there was ambiguity regarding the fault, information could be retrieved using the train's computer systems from the time in question. Notes and explanations were entered into CPID and were exchanged between LU and the relevant infraco until an agreement was reached.

If the parties did not reach an agreement, the issue would escalate to higher levels of the FAP. Only complex performance and operational issues that involved large amounts of money or contract interpretation escalated to the Level C stage of the FAP or to the DRA.

Dispute Resolution Agreement

The DRA, which is also illustrated in Figure Two, dealt with issues of scope, commercial disagreements, and other contract interpretations, often over the allocation of risk. To address disputes, the agreement established a multilayered escalation process involving varying levels of management and other personnel. Most of the steps were internal to the PPP, but if resolution could not be achieved in-house the dispute would be referred to one of the nominated external and independent adjudicators, who were selected jointly by the parties prior to the start of the PPP contract.

If any party was unhappy with the adjudication decision, the option to go to court was available: the adjudication process was not final. To avoid disputes becoming protracted, the DRA imposed time limitations at each level in the process, which could only be extended with the agreement of all involved parties. If an agreement was not reached within the time limit, the dispute would automatically escalate to the next stage.

The first stage of the DRA involved contract managers, who were essential to the DRA because they articulated the arguments behind the dispute. Ideally, disputes would be resolved at the contract manager's stage through discussion and negotiation. The only paperwork required was an initial document serving notice of dispute to the opposing party. The opposing party had no obligation to respond to the dispute in writing, although all the contract managers we interviewed agreed that it was good practice to document some sort of response including reasons behind the disagreement. A referral paper served as a substitute for formal letters, and it helped with mutual understanding of why each party disputed the case. If agreement proved elusive, then the dispute would move to the PPP board.

The PPP board was composed of representatives from both disputing parties. The board meeting was often chaired by the LU contract manager, with other representatives nominated from different levels of management, who would, it was hoped, take a detached and rational view of the dispute so that a resolution could be reached.

The next stage of the DRA was to convene the senior representatives, who were directors or managing directors of LU and the infracos. At this level, discussions about the dispute were often more strategic and commercially oriented.

If the senior representatives could not reach a settlement, the process progressed to adjudication. The external adjudicator provided a final binding decision within forty-two days. If one of the parties rejected or contested this decision, it was free to take the dispute to court.

Role of Knowledge Management in Managing Conflict

The conflict management system included a range of organizational supports. One was a comprehensive contract management database incorporating a

complete guide to the PPP contract. The PPP called this the “knowledge management system” (KMS). Knowledge management is defined as getting the right information to the right people at the right time (Petraash 1996; Tiwana 2001). Staff from both LU and the infracos used the KMS to develop a comprehensive understanding of the contract to help them better fulfill their contract obligations and resolve ambiguities over contract interpretation. The KMS stored what Ikujiro Nonaka and Hirotaka Takeuchi (1995) have referred to as “explicit knowledge” and included the full suite of contract documents, the master definitions of the contract, and agreed changes to the contract. Contract clauses could be easily searched, master definitions were linked to examples within the contract to aid understanding, and variations were documented and linked to the clauses.

In addition, each organization involved in the PPP was responsible for training its staff to understand the contract, its parameters, and implications. These training sessions contextualized the explicit knowledge captured by the KMS to the needs and requirements of each respective PPP organization.

Because training and the use of the KMS alone were deemed insufficient to reduce possible misunderstandings and disagreements, the PPP also adopted many other principles of knowledge management. David McNabb (2007) has outlined five subsystems for public sector knowledge management: (1) information processes, (2) social processes, (3) human interaction, (4) collaborative culture, and (5) organizational learning. The KMS and the CPID (as described above) were designed to formally address the first subsystem, information processes, by using information technology to transform data to information and information to knowledge.

The PPP also sought to use social processes and human interactions to enable parties to create and informally share the tacit knowledge that can be integral to problem-solving ability (Polanyi 1966; McNabb 2007). Staff members of LU and the infracos were initially dispersed geographically at different sites, which prevented face-to-face interaction, but this was quickly addressed. Metronet and LU employees, for example, were co-located on certain projects like the Victoria Line upgrade. Tubelines restructured its operational team so that its organization was similar to LU’s station team, thus improving the communications interface between the two organizations, and LU adapted its contract management to match Metronet’s.

McNabb (2007) argued that the knowledge acquired through informal knowledge sharing is the most important for creative problem solving; however, it is insufficient unless a collaborative knowledge-sharing culture is also present. The extent to which such a culture existed within the PPP varied according to the organizational level. For example, although study participants reported that informal working relationships on the ground were productive, it is unclear how this extended to higher levels within the partnership.

At the most senior management levels, a number of formal processes were used to capture, organize, and share knowledge. Across the PPP contract, a series of meetings such as the senior partnership meeting (involving directors from all partners), the performance review meeting, and engineering partnership meeting, worked in parallel to — but separate from — the formal dispute resolution processes to provide opportunities to discuss issues of concern and their potential to escalate into more contentious conflict, and to develop suitable solutions.

For example, participants at one senior partnership meeting discussed the important matter of cooling the Underground during summer months. Ignoring this issue could have led to performance disputes because the infracos would have been liable if the Underground got too hot. By working together, however, the PPP organizations highlighted the possible performance consequences of this problem and adopted preventive measures.

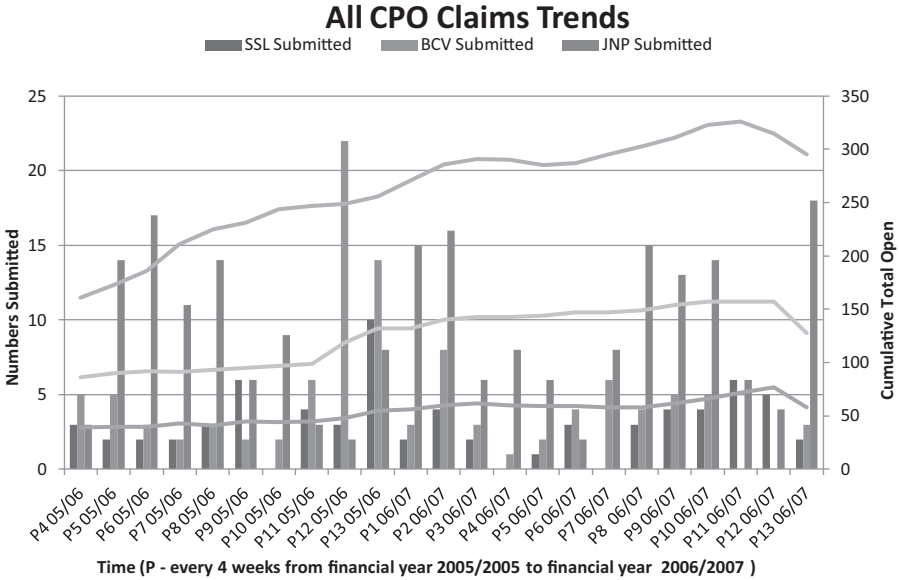
The three partners also frequently surveyed a random sample of employees about their concerns, problems, and experiences to identify possible sources of conflict and devise remedial action. For example, the survey found that Tubelines' operational staff was unsure about which LU station staff to contact to address particular issues, which prompted Tubelines to change its operational team so that its structure aligned with that of the LU station staff.

These arrangements fostered collaborative culture and organizational learning as outlined by McNabb (2007), but evidence from the interviews suggests that members of all three organizations believed these practices should have been used more effectively. For example, LU was reluctant to participate in joint practices designed to improve cooperative relationships and PPP overall performance. On one occasion, it declined an offer made by Tubelines to develop joint targets that would correlate the performance targets of the infracos with LU's targets, a move that would have embedded a deeper collaborative culture, steered organizational and network learning, and made the resolution of disputes easier. Interviewees from the infracos expressed the opinion that LU's reluctance to engage in partnership initiatives was derived from the attitudes of the leaders within LU, who did not view the PPP as an equal partnership arrangement.

Differences in Approaches and Outcomes of the Conflict Management System

The FAP allowed the majority of disputes to be addressed quickly and close to the point of origin. At the time of the research, an LU contract manager interviewed quoted the statistics that approximately 80 percent of performance faults were determined even before the dispute reached Level A and that the vast majority of the remaining 20 percent that entered the process

Figure Three
Trend Analysis of Open and Submitted Chief Programme
Office Claims



(Source: LU Chief Programme Office)

were resolved either by attribution managers from Level A or B or contract managers at Level C.

Given the statistics that LU contract managers were informed by, it was deemed that Tubelines had a marginally better record than Metronet at solving problems at Levels A and B in the FAP, and in fact Tubelines improved its attribution process so much that it rarely had attribution conflict escalate to Level C. Interviews with Metronet's contract manager suggested that approximately 5 percent of Metronet's attributions continued to escalate to Level C. Tubelines apparently performed better because of the investment that the organization made to improve the attribution process. It conducted more training and continually improved operational processes to capture better quality information and knowledge while also continually monitoring the performance of those involved in the process.

Tubelines resolved attribution questions at the lower levels of the attribution process, but was not better overall at resolving conflict with LU than Metronet. In fact, Figure Three, which takes account of other activities beyond the performance of the attribution process, shows a different story.

This figure compares the number of open and submitted claims from PPP partners between 2005 and 2007 that were monitored by the LU's Central Programs Office. Attributions claims involved reaching agreement about appropriate performance levels, whereas the outstanding claims mostly involved conflicts over such issues as payments, delay events, contract breach, contract interpretation, environmental harm indemnity, and third party claims (as indicated in Figure Three).

Outstanding claims also include attributions in abeyance. For example, the infracos may have submitted a claim for work they claimed fulfilled their contract obligations — they were required to demonstrate how they met these standards before LU could make the payment. Issues arose however, when there was inadequate documentation to support the claim. These types of open issues were tricky to resolve. Alternatively, the infracos may have submitted a claim for completed work whose scope was disputed due to differences in contract interpretation: for example, LU may have argued that the infracos completed work beyond their contractual obligation and thus LU was under no obligation to settle the claim. Until this dispute was resolved, this claim would nevertheless have remained recorded (Figure Three).

The data in Figure Three show the number of open and submitted claims from all infracos as recorded every four weeks between 2005 and 2007. Although the data available do not give a full picture of how claims were settled for the entire PPP lifetime (from 2002 to 2009), the data do indicate how claims were handled at the most productive stage of the PPP arrangement and before it was eventually dissolved. The data suggest that more claims were open and submitted relating to the JNP contract (Tubelines). Metronet was less likely to submit claims and was also more likely to resolve them with LU at a greater rate. The data also suggest that LU and Metronet were more likely to resolve several claims together, that is, negotiate “package deals” to solve many claims in one agreement.

The final time period (P13 06/07; shown in Figure Three), indicates that as the partnership progressed, claims closed at a higher rate for all three contracts. The LU contract manager explained that this occurred because LU adopted a strategy of negotiating agreements in numbers, a strategy that had been more successful with Metronet than Tubelines. During this period, Tubelines reduced its open claims by 6.35 percent, whereas the Metronet contracts reduced its open claims by 24.6 percent and 18.4 percent respectively. Metronet seemed to be more accommodating and open to negotiation and compromise, whereas Tubelines apparently was more reluctant to address these outstanding claims if their terms were not met.

For the most part, we believe the contrasting records of the two infracos reflect the different approaches to conflict management and knowledge management adopted by the two organizations. Interviewees

outlined the approach of their respective organizations in dealing with disputes, and it was deemed that Tubelines tended to adopt a formal, rights-based approach to conflict management. Internally, it emphasized that managers consider relevant contract clauses before entering a discussion about a dispute. To this end, the company held internal meetings to adopt positions and develop arguments relating to problems: when Tubelines was convinced of its position, it emphasized winning over working collaboratively to solve problems. It supported this approach with an advanced internal knowledge management system for capturing information that could be used for its own organizational advantage.

On the other hand, interviewees from Metronet described the adoption of a more problem-solving approach, with an emphasis on settling disputes informally with less reference to contract clauses. This was supported by training that emphasized the development of problem-solving skills.

The figures relating to formal disputes also reveal differences in conflict management approaches. Since the beginning of the PPP for Metronet in December 2002 and for Tubelines in April 2003, to the time of our data collection in July 2007, Tubelines had at least ten disputes going through the dispute resolution agreement, whereas Metronet had approximately five disputes across both its contracts. This corroborates our view that Tubelines was more likely to escalate and pursue an issue into the DRA than Metronet was. Although Tubelines did not enter into dispute lightly, in order to resolve the dispute it was more likely to utilize fully the dispute resolution procedures. Metronet, on the other hand, placed greater emphasis on solving problems as quickly as possible and as informally as possible.

Metronet's problem-solving approach is closer to a consensus-based rather than rights-based model of conflict management (Ury, Brett, and Goldberg 1988). Internally, however, Tubelines had more advanced organizational processes to manage the PPP's conflict management system than did Metronet. Tubelines had more integrated and comprehensive procedures to collect and process conflict-related information, whereas Metronet had serious flaws in its processes for capturing and retaining this needed information. Tubelines teams discussed its approach to a particular performance issue or dispute before it was discussed with LU. Tubelines' systematic approach supported the company's rights-based approach.

Metronet's internal organizational system was less advanced. When contesting claims, attributions, or disputes, it was less likely to analyze contractual terms in favor of achieving compromise between the parties. As a result, the two Metronet contracts had comparatively fewer disputes and fewer outstanding claims than Tubelines. Interviewees reported, however, that they believed the Tubelines' formal approach yielded better results because the company was more successful at contesting cases than was Metronet.

A major reason why Metronet adopted a problem-solving approach was because it had less developed organizational processes. For example, when LU required extra work done, Tubelines rigorously analyzed its contractual obligations and made sure the cost for extra work outside the scope of the contract was appropriately negotiated. Metronet, on the other hand, carried out the work without analyzing its obligations and trusted LU to pay for extra work that fell outside the scope of the contract.

Relying on ex-post negotiations turned out to be detrimental to Metronet's financial performance. For example, Metronet carried out extra work for LU installing new air conditioning units. It completed the work without considering what information LU needed to verify it, assuming it would be paid accordingly. But during the installation, the engineers failed to differentiate between new and old air conditioning units, an error that made it harder for the company to support its claim with appropriate evidence.

This type of incident, which reflects poor communication and information processing, was common at Metronet. Thus, without the evidence to substantiate such work, Metronet really had no other option but to adopt a problem-solving approach. Tubelines could use a more rights-based approach because it better understood its contractual obligations, which allowed effective ex-ante negotiation. Further, when negotiating ex post, it had the knowledge management processes in place to ensure it had the evidence to back up the claims it submitted to LU. Thus, although Metronet adopted a more problem-solving conflict management model, more cases would have been settled in its favor if it had had the appropriate knowledge management processes in place. In other words, a problem-solving approach to conflict may not be superior if it rests on underdeveloped knowledge management processes.

The Dynamics of the Conflict Management System

In relation to the four pillars of conflict management previously outlined, we find that the conflict management system of the LU PPP met many of the challenges associated with creating good conflict management in inter-organizational arrangements, but in some areas it was less successful.

Behavior and Skills

Conflict management systems should encourage behavior and skills that build better processes for communication, conflict analysis, problem solving, collaboration, and appropriate decision making. To encourage problem-solving activities, communication processes that facilitate dialogue and inventive problem solving must be in place to prevent disagreements or dispute escalation. Communication is indispensable to effective conflict management (Montoya-Weiss, Massey, and Song 2001). The parties must interact and communicate with each other so they can understand their respective positions and adapt their behaviors accordingly.

The communication processes and flows between the different parties in the LU PPP did not work optimally according to our data. One reason was that LU and the infracos were structurally different, the former being a huge public entity, focused on customer service and improvements, whereas the latter were structured to deliver tightly prescribed obligations. Communicating effectively between such different organizations can be a difficult task. According to the partnership survey administered by the infracos, Tubelines' operational staff found it difficult to communicate with LU station staff and was unsure about LU's structures and who to approach about certain problems.

Additionally, each of the respective parties viewed conflict management training as an important element of implementing the PPP contract. This training was designed and implemented separately to equip the staff to work under the PPP and deal with conflict. The companies choose to concentrate their training in different areas, however. For example, LU concentrated on equipping the staff with better knowledge of the PPP contract and how best to negotiate with the infracos. Metronet concentrated on developing the staff's problem-solving skills, whereas Tubelines focused on how the staff should obtain and share information. These separate training programs obviously shaped how the parties approached conflict and what each party regarded as the most appropriate approach to help resolve conflict in the PPP. A greater effort to combine and harmonize training programs could have helped the organizations reconcile their differences more easily.

How the PPP was perceived to be approached by top management also encouraged contrary behavior among the staff. Interviewees from the infracos were of the view that the managing director of the LU opposed the PPP from the outset. One contract manager interviewed commented that the LU managing director preferred to view the PPP as a "client-contractor" relationship as opposed to a true partnership. This, according to interviewees, diminished the willingness of LU to engage in collaborative arrangements with the infracos. For example, LU was reluctant to participate in joint practices designed to improve cooperative relationships and overall performance of the PPP. On one occasion, it declined a Tubelines offer to develop joint performance targets, which would have made the resolution of disputes easier. Thomas Kochan, George Huber, and L. L. Cummings (1975) noted the role of goal compatibility in dispute resolution, but the LU response was to bluntly state that its targets were in place to monitor the performance of the infracos and not its own.

Values and Attitudes

Interviewees indicated that no coherent or consistent attitude toward conflict existed among the partners, particularly top management. London Underground clearly saw the contract as a client-contractor relationship in

which it “called the shots” and the infracos abided by the contract. Tubelines worked under this premise by ensuring it was well equipped to deal with contractual disputes — knowing its contractual rights and obligations enabled the company to protect its self-interest.

Metronet, however, adopted completely different values. They viewed the first few years of the contract as an opportunity to build good foundations for the thirty-year-long partnership ahead, and adopted such values as compromise, consensus, and problem solving. Indeed, interviewees from Metronet believed building relational attributes such as its reputation for partnership, reciprocity, and trust would enable more satisfactory outcomes for all parties when disputes arose. This approach worked well from the start, particularly because employees working on the contract interface were well trained in problem solving. The two organizations formed a reasonably good working relationship, and, as the contract continued, they established precedents for solving disagreements and disputes as they occurred.

In the end, however, Metronet’s problem-solving approach could not fully cope with the demands of the contract. An audit of LU organizational practices found shortcomings in how claims submitted by Metronet were resolved. As a result, LU was obliged to tighten its procedures to settle attributions and claims. These changes pushed previous precedents aside and required Metronet to back up claims with a battery of evidence and information. But because of its reliance on a problem-solving approach, Metronet lacked the organizational structures, routines, and procedures to present these data. Consequently, more Metronet attributions escalated to Level C in the fault attribution process, souring the working relationship between LU and Metronet.

Thus, Metronet’s informal problem-solving approach ultimately worked to its disadvantage. Although it may be important for a business network to seek to solve problems and disputes informally, clearly it is also prudent for partners to complement informal problem solving with appropriate knowledge management processes so that a conflict resolution reflects appropriate rules and principles. In other words, we argue that complementarity between different conflict management procedures ought to be considered as an important design feature for conflict management systems in PPPs.

Procedures

The third pillar relates to the conflict management procedures. The procedures in place for the PPP were comprehensive, comprising both formal and informal methods as well as recourse to the courts if necessary. As part of the PPP contract, the formal procedures for dispute resolution were designed *ex ante* to address the types of operational and commercial disputes that were likely to occur throughout the day-to-day and strategic

operations of the contract. For the most part, the FAP established for resolving operational issues enabled managers from across the partnership to interact closely and share explicit knowledge about operational performance and contract obligations. The KMS and CPID both supported fault attribution, by enabling parties to share knowledge about contractual obligations, performance, and operational issues. Via social processes and human interaction, the PPP staff was able to develop and share further tacit knowledge and thus was able to address informally most of the problems that surfaced before engaging with the formal FAP or DRA.

These information- and knowledge-sharing activities allowed working relationships to be forged between LU and the infracos, as managers on the ground became increasingly aware of each other's orientations to problem solving. Concurring with neo-institutional theory, which stresses the use of less complex arrangements whenever possible (Steijn, Klijin, and Edelonbos 2011), these relationships allowed the managements across the PPP to interact with each other in predictable and stable ways, encouraging informal problem-solving activities. In other words, the knowledge management processes adopted by the PPP allowed for the braiding together of formal and informal conflict management.

When the parties put the formal contractual dispute resolution procedures into practice, however, a number of fault lines emerged, particularly in relation to the role of the PPP board. For example, at the outset of the contract, the PPP board representatives were supposed to use this forum not only to resolve disputes but also to identify and mitigate potential problems. Initially, the PPP board used the forum enthusiastically to share information and solve problems; however, these activities diminished when disputes escalated to the board for resolution. The PPP board was therefore never able to fulfill this dual role. In fact, two of the contract managers interviewed commented that the entire concept of such a dual role was flawed from the beginning: a forum for information sharing and problem solving cannot sit comfortably with a forum for bargaining and negotiation.

Structure and Roles

At the outset, the PPP contract stipulated structures and roles to ensure the appropriate working of the conflict management system. For example, the ex-ante appointment of contract managers and Level A and B managers was integral to the effective implementation of the fault attribution and dispute resolution processes. These people coordinated respective conflict management approaches within their companies and often worked collaboratively with the other parties to ensure more effective structures were in place to facilitate better conflict management. For example, Tubelines and LU worked together to restructure departments where employees were unsure of whom to approach to resolve issues across the contract interface.

Although we found some evidence that conflict management was coordinated across the PPP, it was by no means widespread. In fact, the lack of coordination was another factor that hampered the conflict management system and aggravated working relationships. The PPP conflict management system had no centralized capacity to frame conflict, or monitor or evaluate the system.

People use frames to define situations, organize information, and assign importance to situational characteristics (Pinkley 1990; Pinkley and Northcraft 1994). Framing is important to conflict management because it allows parties to interpret disputes and disagreements in a similar fashion. But the decentralization of the conflict systems made it difficult to frame disputes in a corresponding manner. The three parties framed disputes differently, according to their own distinctive values, interests, and objectives.

Cross-organizational training and discussion could have helped tackle this problem, providing the parties the opportunity to understand each other's interests, values, and objectives. The lesson here is that without active support from leadership, partnerships (and other organizations) will not realize a conflict management system's full potential.

As the central partner in the PPP contract, LU could have used the PPP board to take more decisive action in coordinating conflict management within the partnership. London Underground could have made a stronger effort to transfer its knowledge of the underground operation to alert its partners to possible conflicts or disputes. London Underground could have also used the PPP board to circulate potentially relevant information from one contract to its partners on a different contract. As the focal organization in the PPP, LU should have taken responsibility for coordinating these meetings, emphasizing the potential for open discussion. In the end, the PPP board met infrequently, which reduced the opportunity for LU to play a greater role in conflict management coordination, and the PPP board became solely a venue for dispute resolution.

Poor processes for monitoring and evaluating the entire system also hampered its effectiveness. Experts have argued that conflict management systems should have built-in learning capabilities, which allow shortcomings in procedures to be detected (Costantino and Merchant 1996; Slaikeu and Hasson 1998). Analysis of performance trends allows adjustments to be made so that past mistakes are not repeated. Attempts were made to track the number of claims and attributions that arose in the PPP; however, these measures were not used to instigate improvements within the system as a whole. Instead, the parties completed their own data analysis for their own use.

We also found that pressures from outside the conflict management system could prolong conflict between the partners. Stakeholders and other departments within particular organizations often offered differing opinions on whether to pursue a dispute and how it should be resolved.

They sometimes advocated pre-fixed positions, which were sometimes unreasonable and inconsistent, reducing the potential for effective problem solving. One Metronet interviewee conveyed his frustrations at the mixed messages received from his contract and finance teams about how quickly the outcomes of disputes should be addressed. These mixed messages placed the negotiating team in a difficult position and made its task of settling disputes more difficult, particularly because the interference often encouraged self-interested behavior as opposed to behavior that benefitted the partnership as a whole.

Thus, our data suggest that conflict management systems within a PPP would benefit from greater coordination, monitoring, and evaluation. Designating specific individuals as conflict management champions or cross-organizational coordinators could have provided a more coordinated approach to conflict management. London Underground, as the central party involved in the PPP, could have taken more responsibility for organizing this coordinated approach by more actively managing the activities of the individual parties and intervening to make the system more integrated. In this case, individual parties initiated particular adjustments to maximize their own interests, but only rarely did the parties collaborate to change the overall conflict management system. Conflict management was regarded as a mechanism to address the disputes that would arise as each organization pursued its own objectives rather than as a series of procedures to build a culture of cooperation and trust inside the PPP.

Conclusion

The PPP was dissolved in 2010, but conflict management failures were not seen as significant precipitants of its termination. Metronet went into administration for several reasons, most notably because it used its shareholders and their contractors as suppliers rather than going through the process of competitive bidding. The executive management of Metronet also changed frequently and was unable to manage its supply chain. Tubelines failed after the arbiter questioned its financial viability given wider constraints in the challenging financial markets that emerged after 2008. The political context of the PPP had also changed, with many key stakeholders, such as the Lord Mayor of London Boris Johnston, describing the PPP as a “shambles.” Thus the decision was made that TfL would buy out Tubelines and bring it under public control, thus terminating the PPP altogether.

For this article, we assessed the operation of the conflict management system put in place in the LU PPP, while it was still fully operational in 2007. We found that a carefully designed conflict management system was in place that worked reasonably well. The incidences of disputes were not excessive and most were settled relatively quickly. But the system was also found to have fault lines, and as a result, this study suggests several lessons

that could be applied to these increasingly popular inter-organizational partnerships.

First, we argue that formal arrangements should be established to address conflict: the resolution of disputes and problems should not be left to happenstance or to unstructured and potentially ineffective informal processes that can lead to uncertainty and suspicion among parties. Second, leaders must make the effort to develop shared values, attitudes, and approaches to conflict management across partnership organizations. They should further establish positions for coordinators who would work with all parties to create a more integrated conflict management system for a PPP. They can accomplish this by implementing centralized training programs, assigning conflict management champions, and using the partnership board, or comparable entity, more effectively.

Third, any formal conflict management system should be designed to promote informal problem solving and dispute resolution: formal and informal conflict management systems should not be considered as rivalrous, but as processes that need to be integrated. At LU, formal and informal conflict managements were integrated using knowledge management principles. Knowledge management locked the various parties into a shared information regime and thus made it easier to pinpoint the source of problems. As a result, it became difficult for any party to hold obstinately to a view in the face of contrary evidence. Where the source of a problem was not transparent, the conflict management structures encouraged the parties to engage with each other so that a resolution could be jointly determined. In other words, the knowledge management processes adopted by the PPP encouraged collaborative work that facilitated informal conflict management, particularly at an operational level. The mutual exchange of knowledge, we argue, is essential to effective conflict management in organizational networks such as those being created in the public sector because it forestalls misunderstandings and builds problem-solving capacity.

Fourth, the preceding analysis suggests that it is preferable for conflicts to be solved informally, where the parties seek to identify and accommodate their needs and interests through joint problem solving. These informal methods are less costly, more versatile, and more satisfactory because they address more of the concerns of disputants than do other methods. However, we found that relying solely on informal problem-solving methods to address disputes in this kind of partnership carries risks. Not all problems can be solved informally, and parties sometimes need to handle conflict via formal rules and principles and appropriate knowledge management processes that will complement a “rights-based” approach to resolving disputes. In other words, both formal and informal methods need to be internalized within a business network. The presence of formal and informal capacities to solve conflicts will allow the conflict management system to be greater than the sum of its parts.

Lastly, we also argue that not all problems may be rectifiable through a conflict management system, especially when the inter-organizational partnerships rest upon insufficient governance and risk management frameworks. The design of the LU PPP had flaws from the outset that were impossible for the conflict management system to resolve. But regardless of the inevitable failure of the PPP, this case indicates that conflict management must be taken seriously and recognized as integral to new public management organizational forms.

NOTES

1. The system expanded significantly in the 1960s and 1970s when the London Passenger Transport Board (as it was then called) opened the Victoria and Jubilee Lines and extended the Piccadilly Line to Heathrow airport in 1977. The Jubilee Line was again extended in the late 1990s.

2. Transport for London was established in 2000, taking over the responsibilities from the preceding authority, London Regional Transport, to implement the transport strategy for London under the Mayor of London's office. TfL was due to take over LU once the PPPs were signed. This happened in January 2003.

3. "Capability" measures passenger journey time for the given capability of the railway infrastructure. If the infracos improve the infrastructure to enable a more efficient and faster service, they will receive bonuses for good performance. Abatements will be issued if passenger journey time is affected; for example, if the condition of the infrastructure is such that a speed restriction is required, over a period of time the infracos will be abated. "Availability" assesses the availability and reliability of train and station infrastructure. It is measured in terms of lost customer hours, for example, if a train or escalator is out of use during rush hour, this will cause delays to the customer and therefore the infraco will be abated. "Ambience" measures the quality of the train and station environment in terms of cleanliness, condition of stations and trains, and modernization of stations. It is assessed by "mystery shoppers" raising abatements for litter and graffiti, for example, or raising bonuses for more modern and clean surroundings. "Fault rectification" measures the speed and quality of fault fixing within a standard clearance time. For example, faults with trains, pumps, lighting, and drains must be rectified as soon as possible; if not, infracos will accrue abatements. Spillages must be removed within one hour, whereas train rolling stock faults must be rectified within fifteen days.

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