Negotiation Characteristics in Brownfield Redevelopment Projects

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Abstract—Brownfield areas are contaminated lands that lie unused and unproductive. Because of the serious economic, social, political, and environmental damages that brownfield problems can cause to society, governments are focusing their attentions on the redevelopment of these contaminated sites. However, the excess costs of reconstruction projects over their benefits often stall the initiation of projects. Moreover, brownfield projects involve several uncertainties that seriously contribute to the challenges of brownfield redevelopment, such as uncertainty about the extent of contamination and the uncertainty in cleanup costs. To overcome these challenges, negotiation among the involved parties (government, owner, purchaser, and their stakeholders) is one of the most efficient tactics to arrive at a mutually acceptable solution and, as such, saves an enormous amount of time, cost, and resources. This paper aims at discussing the negotiation process associated with remediation and redevelopment of brownfield projects. Timing, type of contaminate, extent of contaminate, zoning, offsite impact, and the number of players are some of the most important factors affecting the study of brownfield negotiation and their ultimate redevelopment. The needs and interests of the various parties involved in a brownfield negotiation process are discussed. Initial steps towards the development of a decision support system for resolving brownfield conflicts through negotiation are then highlighted.

I. INTRODUCTION

According to the US Department of Housing and Urban Development [1], Brownfield projects refer to abandoned, idled, or under-utilized residential, industrial, and commercial sites exposed to environmental contamination. Brownfield areas include decommissioned refineries, former railroad yards, old waterfronts and riverbanks, crumbling warehouses, abandoned gas stations, former drycleaners and other commercial properties where toxic substances may have been used or stored. Canada has about 30,000 brownfield sites [2]. Costs of cleanup for these sites are estimated to have been used or stored. Canada has about 30,000
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Canadian dollars. Left as they are, brownfield sites can harm local economies and pose threats to human health and environmental quality. Moreover, if brownfield sites are left idle and unmanaged, they represent a significant loss of economic opportunity to the community in which they reside. They can also adversely impact a neighborhood’s image and quality of life while negatively impact neighborhoods and values. On the other hand, when redeveloped and returned to productive use, brownfield areas can generate significant economic, environmental, and social benefits [2].

II. BROWNFIELD CONFLICTS AND DISPUTES

Because of the environmental and health risks associated with brownfield contaminated areas [3], legislations require the owners of such properties to clean up the contamination. However, due to the high cost of remediation, potential investors are typically not motivated enough to buy and redevelop brownfield areas [4]. Begley [5] also noted that developers and investors are concerned about the risk of future liability. In addition, many researchers and practitioners (e.g., [6], [7], [8], [9], [10]) have represented many challenges such as chain of title liability uncertainty, lender hesitation, time to occupancy, community support, proposed land use, condition of the local infrastructure, support of local politicians, availability of financial incentives, and the number of jobs to be created. It is essential, therefore, that government representatives (e.g., municipalities) promote cooperation between owner(s) and potential investor(s) so that the parties may share the cost as well as the benefits of redeveloping brownfield sites.

Because of the above challenges, many unexpected events may happen during the remediation process. Such unexpected events may bring the remediation to a temporary halt, resulting in delays, cost overruns, and conflicts among the parties involved [11]. In brownfield conflicts, like many other conflicts, various dispute resolution procedures are available, as shown in Figure 1, with different levels of outcome control and associated costs [12]. In order for the parties involved in brownfield conflicts to resolve conflicts in a less costly and less hostile environment (left side of Figure 1), negotiation is one of the most successful choices where parties try to reach a mutual agreement.

Negotiation over brownfield problems allows all parties to fairly share the uncertainties and risks involved in brownfield conflicts. In the brownfield negotiation process, the parties present offers and counter-offers while their objectives and interests are often hidden. As discussed by Loosemore [13], decisions in this process involve offer-formulation and...
concession-making. Explanations, threats, inducements, incentives and other forms of communication often complement offers. Concessions are made in the goal space and typically result in some sort of reduction of the expected goal achievement levels [11].

![Dispute resolution continuum](image)

**Fig. 1.** Dispute resolution continuum (adapted from [12]).

III. NEGOTIATION CHARACTERISTICS OF BROWNFIELD PROBLEMS

Before a negotiation decision support system can be formulated, it is important to discuss the main concerns and the cooperation behavior(s) of the involved parties (government, owner, and purchaser) [14]. The following eleven points have been compiled based on previous studies and several meetings among consultants, researchers, and representatives from City of Kitchener (located in southern Ontario, Canada) concerned with Kitchener’s brownfield sites.

1. The current owner of a contaminated site usually has legal obligations to bear the cleanup costs, but often lacks the funds or the will to do so. They are interested in sharing some of their financial responsibilities for cleanup by negotiating a favorable sale price that limits current and future liability for cleanup. Sometimes, however, owners are reluctant to enter into negotiation with potential purchasers because the negotiation process may provide information that could be used by an enforcement agency to force cleanup. While a brownfield property, by definition, is suspected of being contaminated, many brownfield properties have not undergone environmental assessment and testing. As such, while those concerned may be confident that the site is contaminated, the officials may not be able to take action against the owner to force a cleanup because direct evidence of contamination has not been established [2].

2. Before buying a brownfield site, the purchaser is likely to require environmental confirmatory testing. If contamination is confirmed, the owner may have legal obligations to report the contamination to municipal authorities [3]. Although owners can ignore this responsibility, risks of legal exposure increase if they do so. Some owners are reluctant to enter into a negotiation for sale because of the increased risk of legal action that the process entails. In some cases, the owner appeals poverty or declares bankruptcy and thus tries to avoid paying legally sanctioned penalties. Also, because of the stigma attached to contaminators, the owner sometimes may avoid revealing his or her identity. The owner comes to the negotiation table primarily for waivers of the liabilities.

3. In the negotiation process, the purchaser takes into account the preferences and interests of the owner and vice versa. Although the purchaser is attracted by the future business prospects of the site, there might be several forms of risks. Cleanup cost, for example, may be more than predicted, thereby reducing the purchaser’s profit from the sale. The surrounding area may not develop and a stigma may be attached to the property making future business prospects difficult [15]. It is possible that more than one purchaser is interested in purchasing a contaminated site. In this event, a sale may be negotiated between the seller and the highest bidder. Practically however, this is rarely the case for brownfield sites. Unless the site is a highly attractive one, such as one in a busy commercial area, the anticipated costs and risks of contamination generally limit the number of potential purchasers. Usually, depending on the location, there will be just one purchaser who is clearly willing to pay the most. For example, in a busy urban location, retailers and fast food chains may show the most interest. In remote locations, warehouse contractors may show the most interest [11].

4. Among the most important parties in the Brownfield remediation and redevelopment process is the government (e.g., municipality). Whether a deal can be put together at all may depend entirely on the resources that the municipality is willing to bring to the negotiation table. In most cases, the municipality is interested in seeing the site redeveloped, because the communities in the region benefit greatly from the redevelopment. Cleanup improves the image of the area and attracts new businesses to the region. Property values increase and tax revenues grow. However, the level of resources invested by the municipality needs to be justifiable in terms of benefits to local residents as tax payers and this is the main concern of the municipality. Also, the government representatives will be concerned with the accountability of their decisions, the public visibility of potential downside risk and possible reversion of a site to brownfield status due to newly discovered and/or non-remedied contamination. Nevertheless, municipalities are usually interested in reducing the risks...
associated with brownfields, and may be willing to negotiate.

5. In addition to cost and time saving, the common objective of all parties is to accomplish the brownfield reconstruction successfully so that all parties benefit from the remediation of a contaminated area. Although the parties try to reach mutual agreement through an initial step of cooperation, they strive to set up their positions for the sequential steps of the negotiation process while taking into account the ensuing constraints [16]. Therefore, the study of negotiation process becomes crucial for the involved parties.

6. When the involved parties want to cooperate on brownfield issues, they consider how the negotiation process is initiated and conducted so that each party is able to mutually bargain over conflicting issues. To initiate a negotiation process, involved parties, especially the purchaser, must feel that they are not going to lose anything; conversely, they have to feel they gain something through negotiation. By negotiating, the purchaser, for example, knows the owner’s concerns and preferences and vice versa. Also, the negotiation process has to cover the uncertainties which are revealed at the negotiation table. In other words, the process should finalize a risk-sharing agreement through a contingent contract that covers the uncertainties. A majority of the actual settlements are indeed contingent contracts [11].

7. To facilitate the negotiation process further, some inducements may be needed to persuade the parties to continue for a negotiated concession on the sale price and allocation of cleanup costs. Most often, the municipality will need to create inducements to encourage negotiation and, specifically, to use a structured negotiation support system. Municipalities have a number of tools available to encourage the owner and the purchaser to come to the negotiation table. Preferably, municipalities have developed a working relationship with the owner in which the mutual goal of the turning over and cleaning up of the property is recognized by both parties. In this case, the owner and government representatives can work together to find a purchaser for the site so that the negotiation process develops from a two-party negotiation to a three-party negotiation. When the purchaser is involved in the negotiation process, the government must adjust its preferences so that the purchaser and the owner feel they are being treated fairly. When a Brownfield problem is addressed, it is very important how “fairness” can be associated with the negotiation process and this is often a challenging task [17].

8. The owner is usually encouraged by the assistance of government officials in marketing the property and in dealing with the costs of cleaning up the site. In some cases, however, owners are unwilling to cooperate without explicit inducements. For a contaminated site, the cost of environmental cleanup is calculated into the market value of the site, which could result in the government owing nothing in compensation because the cleanup costs are more than the value of the land. Therefore, the threat of exercising this option by the government may be sufficient to bring an owner to the negotiation table.

9. Gaining the cooperation of the purchaser can also require some special inducements. While a purchaser may see the opportunity for financial gain in redeveloping a brownfield property, many other options for investment are available. Only in rare instances, such as a facility owner seeking to expand an operation and needing to acquire a neighboring brownfield site, will the purchaser have strong incentives for acquiring a brownfield. The brownfield property presents an economic opportunity only to the extent that the returns are corresponding with returns from other investments.

10. Prospective purchasers can be induced to participate in the negotiation process if they believe that the negotiation process is likely to result in a better deal than which could be negotiated outside the negotiation process. Municipalities can create this belief by making participation in the negotiation process a condition for receiving certain kinds of government assistance with redevelopment costs. For example, government officials might require participation in the negotiations for any project intending to make use of Tax Incremental Financing (TIF) [2]. In essence, the municipality indicates to prospective purchasers that participation at the negotiation table is a prerequisite to obtaining some of the most valuable kinds of government financial assistance, such as the TIF. Also, the prospective purchaser can be influenced by tax subsidies and forgivable loans [2]. The government may be able to raise more funds by highlighting to the public the expected increase in property values. According to the municipal officials from the City of Kitchener, getting the purchaser to the negotiation table is a formidable task. The purchaser cares more about the market value of the site than other matters, since other non-contaminated sites are almost always available. Through incentives such as tax credits and loan guarantees, the municipality can persuade the purchaser to come to the negotiation table and/or continue in the negotiation process until mutual agreements can be reached.

11. The differences between publicly-owned sites and privately-owned sites significantly influence the brownfield negotiation process. This is mainly due to the changes in preferences and objectives of the parties involved. The differences are explained in more detail in the next section. Also, the number of parties involved in a brownfield negotiation process may vary depending on the need of negotiation. In other words, different scenarios may take place for a negotiation process. For example, the negotiation process may initially start between two parties (e.g., the government and the owner) and the third key party (e.g., the potential purchaser) may subsequently join the negotiation process.
The above negotiation characteristics in brownfield problems have been summarized in Table 1.

### TABLE I
**SUMMARY OF NEGOTIATION CHARACTERISTICS IN BROWNFIELD PROBLEMS**

<table>
<thead>
<tr>
<th>Involved Parties</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Lack of the funds or the will to cleanup the contaminated property</td>
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<tr>
<td></td>
<td>• Expecting government help in marketing the land</td>
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<td></td>
<td>• Willing to share its liabilities for cleanup through negotiation</td>
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<tr>
<td></td>
<td>• Sometimes avoiding to officially cooperate when the owner must cleanup the land</td>
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<tr>
<td></td>
<td>• Avoiding revealing his or her identity</td>
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<td></td>
<td>• Trying to understand the concerns of the perspective purchaser</td>
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<tr>
<td></td>
<td>• Costs of redevelopment</td>
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<tr>
<td></td>
<td>• Not concern about the future risk of site contamination</td>
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<tr>
<td>Purchaser</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Preferring to have environmental testing / certificate</td>
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<tr>
<td></td>
<td>• Willing to receive incentives from other parties</td>
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<tr>
<td></td>
<td>• Taking into account the preferences and interests of the owner</td>
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<tr>
<td></td>
<td>• Very concerned about the risks of buying the property</td>
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<tr>
<td></td>
<td>• Usually one purchaser is considered in buying the contaminated property</td>
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<tr>
<td></td>
<td>• Time and cost of redevelopment</td>
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<tr>
<td></td>
<td>• Responsibilities of future contamination not caused by purchaser</td>
</tr>
<tr>
<td></td>
<td>• Considering other options for investments</td>
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<tr>
<td>Government</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Available resources of municipalities are the key issue to make a deal among involved parties</td>
</tr>
<tr>
<td></td>
<td>• Fair working relationship with both the owner and the purchaser</td>
</tr>
<tr>
<td></td>
<td>• Key role to initiate negotiation process in various phases of negotiation</td>
</tr>
<tr>
<td></td>
<td>• Providing inducements for both the owner and the purchaser</td>
</tr>
<tr>
<td></td>
<td>• Willing to have contaminated property cleaned up and redeveloped</td>
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<tr>
<td></td>
<td>• Considering private-owned brownfield sites as being different from public-owned brownfield sites</td>
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<td></td>
<td>• Using reactive approach to deal with brownfield problems</td>
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<tr>
<td></td>
<td>• Concern about the justification of the resources used for brownfield redevelopment</td>
</tr>
<tr>
<td></td>
<td>• Non-remedied contamination is the key future concern</td>
</tr>
<tr>
<td></td>
<td>• Tend to be more risk averse</td>
</tr>
</tbody>
</table>

### IV. CASE STUDY: THE PHARMASY SCHOOL OF THE UNIVERSITY OF WATERLOO

In this section, a case study in brownfield negotiation is introduced and the implementation of negotiation characteristics, summarized in Table 1, is discussed. In 2004, through the creation of a $110 million Economic Development Investment Fund, the City of Kitchener took bold steps to improve the local business environment and invest in strategic infrastructure. Kitchener City Council's approval of this unique and flexible Economic Development Investment Fund - the first of its kind in the province of Ontario, and possibly the nation - enabled the City to forge innovative partnerships that have led to the creation of an exciting new downtown Education and Knowledge Creation Cluster. The objectives of the City of Kitchener are outlined as follows:

1. Diversifying and expanding Kitchener's economic base and generating significant impetus towards the revitalization of downtown Kitchener and creating a vibrant core area,
2. Attracting the education and knowledge creation sector will provide a critical balance for the city, which can lessen the impact of economic downturns in the future,
3. Stimulating Kitchener's economy through ongoing expenditures by students and visitors,
4. Stimulating an influx of health-related start up businesses,
5. Stimulating residential growth in the core, and
6. Redeveloping vacant and underutilized downtown buildings and lands.

To achieve the above objectives, a number of projects are under development or have been completed. One of the projects is the redevelopment of former industrial land at the corner of King and Victoria streets in Kitchener. The site had already been contaminated and the property owner was liable to cleanup the land. The City of Kitchener started negotiating with the initial property owner, BF Goodrich, a tire producer. The site (factory) was then sold to Epton around 1990, and because EPTON could not use the site as it wished, the site was sold to Polyone an American-based corporation in the year of 2000. Initially, there was no potential purchaser and the City of Kitchener and Polyone started a two-party negotiation to come up with the best agreement by which the owner could cleanup the land at minimum cost and with maximum assistance from the City of Kitchener. After some rounds of negotiation, the University of Waterloo entered the negotiation process by showing interest in constructing its new School of Pharmacy in downtown Kitchener if the land could be cleaned up and environmental confirmatory testing were done. As such, a two-party negotiation was expanded to a three-party negotiation process. To reach mutual agreement, the City of Kitchener provided enough incentives for both the owner and the purchaser. It should be noted that the site was owned by a privately-owned company and the purchaser was a publicly-owned institution and this situation made this case study a very interesting scenario for starting a brownfield negotiation process due to the diverse preferences and interests of the involved parties. To sum up, a mutual agreement was reached between the City of Kitchener and Polyone so that Polyone agreed to cleanse the site (i.e., the
remediation process) as a result of receiving considerable incentives (e.g., Tax Incremental Financing, TIF) from the City of Kitchener. From the purchaser’s point of view, the University of Waterloo agreed to construct its School of Pharmacy when the remediation process was finished. In this case study, the involved parties frequently implemented the brownfield characteristics summarized in Table 1. Also, innovative ideas presented by the parties significantly helped the parties to overcome the challenges faced during the negotiation process.

The eleven points summarized in Table 1 present a clear view of the objectives and needs of the various parties involved in brownfield redevelopment negotiation process. These are useful in determining ways to encourage the players to actively participate in the negotiation process. These points are also essential for the development of a practical decision support framework for brownfield conflicts.

V. ON-GOING RESEARCH: BROWNFIELD NEGOTIATION FRAMEWORK

Based on the understanding of negotiation characteristics of the parties involved in brownfield projects as discussed above, a negotiation methodology can be developed using Graph Model for Conflict Resolution (GMCR) method [18], [19]. Also, the concepts of Game Theory and Negotiation Theory will be utilized to facilitate understanding of the behavior of the involved parties in brownfield cooperation environment as shown in Figure 2. Game Theory is the study of human decision based on the premise that each player’s decision can affect the outcome for all other players [20]. Negotiation Theory is also the study of how to reconcile differences and reach consensus [21], [22]. The GMCR and the concepts of the two theories cover both the quantitative and qualitative aspects of Brownfield negotiations.

The proposed negotiation support system is intended to provide suggested settlements, negotiation information, preparation, and support for the process that should be followed. It will assist decision makers to overcome the challenges of conventional negotiation through a range of analytical tools to clarify interests, identify tradeoffs, recognize party satisfaction, and generate optimal solutions [17]. Their aim is to better prepare decision makers for negotiation or to support them during the negotiation process.

The proposed negotiation support system offers robust win-win solutions for disputants to complete the projects. Accordingly, it should help to reduce environmental and health risks for society and at the same time provide an expanded tax base for municipalities and enhanced investment opportunities for private partners by bringing underutilized land back into productive use.

VI. CONCLUSIONS

The redevelopment of brownfield sites is becoming increasingly important because of their environmental, economical, social, political, and health impacts. With brownfield redevelopments, the involved parties strive to find a solution for cleanup and remediation. One of the key methods is to create a cooperative environment among the parties (e.g., government, owner, developer) so that the different ideas, interests, and preferences of all parties can be effectively addressed and efficiently exchanged. This paper discussed the importance of negotiation tactics in Brownfield projects and presented expert opinions about the negotiation preferences and needs of various parties. Research is currently on-going to develop a practical decision support framework for negotiation in Brownfield problems.

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