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Measuring Success: Community Analytics for Local Economic Development

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Abstract:

Main Street organizations are community-based nonprofits across the USA dedicated to local economic development through physical improvements, technical assistance to businesses, marketing and place-building. In this paper we identify metrics associated with success in local economic development and generate decision opportunities for improved program design and implementation. Our community partners, Main Street organizations in the city of Boston, want to ensure that data they collect about their service areas can help them measure progress towards achieving their individual goals as well as identify programs and initiatives that make best use of their resources and expertise. Using a mixed-methods, inductive approach rooted in Keeney's value-focused thinking method, we engage directly with members of local communities to identify priorities for local economic development. The result of our analysis is 'values structures' by which we identify performance metrics and decision opportunities. These analytic outcomes allow us to identify variations in values structures across stakeholder groups and communities, and to learn if certain types of economic development metrics appear to be specific to certain stakeholder groups and community types. By connecting core values of stakeholders with elements of decision models, and providing specific suggestions for data collection and decision alternatives, our findings may contribute to research and practice in community operational research, local economic development and other domains.

1. **Introduction**

Paper motivation

The devolutionary nature in American governance has made the focus of urban policy to delegate responsibilities to outside organization such as community-based organizations (CBOs) and community development corporations (CDCs). This paper focuses on Main Street organizations, which are localized members of the Main Street America network of CBOs dedicated to local economic development through physical improvements, technical assistance to businesses, marketing and place-building (Robertson, 2004; Seidman, 2004). While Main Street organizations are nominally independent, they are still beholden to policy makers and public agencies. In the city of Boston, the source of data for our study, neighborhood-based Main Street organizations receive the bulk of their financial support from, and are required to report on their activities to the city's Department of Neighborhood Development. Boston Main Street directors want to ensure that data they collect enables them to set priorities for various potential initiatives, manage their daily operations and evaluate the impact of their work. However, BMS directors generally do not have the time or resources to identify and quantify the metrics necessary to achieve this goal. These challenges are not uncommon among CBOs and other nonprofits serving urban communities (Wallace, 2014) and is consistent with recent research identifying a disconnect between knowledge and use of data analytics & information technology (IT) among nonprofit organizations (Johnson, 2015). In contrast, the analytics movement generally presumes familiarity with the use of large datasets, quantitative methods and a small set of objectives traditionally associated with the private sector or larger government organizations (Liberatore and Luo, 2010; Winston, Albright and Zappe, 2010).

Paper goals

The goal of this paper is to identify metrics associated with success in local economic development and generate decision opportunities for improved program design and implementation. Responding to the pragmatic focus of Main Streets organizations and other CBOs, our analysis uses systems-type thinking to broaden the concept of outcomes (vs. outputs) and decision opportunities (vs. defined tasks) that Main Streets organizations are familiar with. We apply mixed-methods, inductive approach, rooted in Keeney's value-focused thinking and objectives identification (Keeney, 1996; Siebert and Keeney, 2015) to develop 'values structures' by which we can identify performance metrics and decision opportunities. By engaging directly with members of local communities to identify priorities for local economic development, we believe that the recommendations we make for data collection and

decision-making can reflect core values of a diverse set of stakeholders, rather than simply Main Streets directors. Our analytic strategy is representative of recent work in the domain of 'community-based operations research' (Johnson, 2012), itself aligned with and derived from community operational research (Midgley and Ochoa-Arias, 2004).

Boston is racially, ethnically and economically diverse. Therefore, the values associated with local economic development priorities are likely to vary across neighborhoods. With 21 Main Street organizations serving this city, a traditional application of VFT in which stakeholders discuss values during a single group session is not feasible. Instead, we pursue a multi-site case study approach, in which we develop values structures for three Main Street organizations that, though serving distinct communities, together reflect the socio-economic diversity of the city.

Research questions

Through our analysis, we hope to address the following research questions: What are the values of those who are closely engaged or affected by the work of certain Boston Main Streets organizations? What performance metrics and decision alternatives can be derived from these stakeholder values? What variation in these values, metrics and alternatives can be observed according to geography and stakeholder group membership? Do these metrics and alternatives represent an improvement over the status quo? Are the metrics easily quantifiable? Can we identify common values that might generate performance metrics and decision alternatives to meet the needs of a diverse group of Boston Main Streets organizations? In answering these questions, we hope to identify themes across stakeholder groups and neighborhoods that can generate recommendations for economic development policy and practice.

Research and practice context

The Main Streets movement has its roots in National Main Streets, founded in 1980 by the National Trust for Historical Preservation with the goal of preserving the physical character and spurring the economic development of downtown commercial districts of cities which have been economically devastated by post-War urban development. Main Streets seeks to achieve its goals through the "4 Point Model" of organization, design, promotion and economic restructuring (Seidman, 2004). There are over 1,000 Main Streets organizations across the United States, including 43 statewide Main Streets organizations. Boston Main Streets was started in started in 1995 by then-Mayor Thomas Menino. As a councilman in 1983, Menino started the Roslindale Village Main Streets. Today there are 21 Boston Main Streets organizations. Each individual Boston Main Streets organization is an independent

organization with 501(c)(3) status. However, all Boston Main Streets organizations operate under the auspices of the City of Boston through the Department of Economic Development, which provides the majority of funding for each of the Main Streets offices.

Community-based organizations, like many others, need and benefit from data – however, the real value of data lies not in the collection of words, symbols and bits that reside in repositories, but the information derived from them that enable organizations to better manage their daily operations, design new programs and interventions to fulfill their core mission, and to refine their strategy to ensure long-term prosperity. However, CBO needs for data, and the performance metrics and evaluation information based on these data, are often not fully understood since the focus of discourse is from the private sector (McAfee and Brynjolfsson, 2012). Unlike the private sector, CBO's data needs are complex (Johnson, 2015): there are often multiple objectives (social and operational goals), multiple stakeholders (clients, residents, government), multiple funding sources (government, foundations, social enterprises, donations) and multiple partner organizations. In addition, the organization's mission may incorporate or imply performance measures that are difficult to make tangible or to quantify. CBOs may serve distressed communities with limited resources and therefore limited capacity to gather and analyze the sort of data that could help them do their job even better.

The primary analytic method we use in this paper is value-focused thinking (VFT). As argued by Keisler et al. (2014), VFT is a type of problem solving method (PSM, see Rosenhead and Mingers, 2001) which enables the integration of multiple stakeholder perspectives. Traditionally, decision making processes are focused on identifying alternatives and tend to be reactive. VFT is a proactive approach that focuses on what the decision maker wants to achieve. Rather than focusing on decision problems provided to the decision-maker to solve, the focus is turned to decision opportunities identified by the decision-maker through identification of values, criteria, objectives and decision alternatives (Keeney, 1996). However, values structuring approaches can be challenging to use in practice: individuals tend not to fully understand the depth of what their personal knowledge and underutilize applying their values to create objectives (Bond, Carlson and Keeney, 2008). VFT has only recently been applied to community-based organizations as opposed to large government agencies and for-profit companies (Keisler et al., 2014; Johnson et al., 2016).

Paper roadmap

In Section 2, we survey the methodologies (world-views; research domains) and methods (tools; analytic approaches) that provide a basis for this study. Section 3 describes three sets of data we have used for the project. Section 4 contains a description of our research findings, from identifying case study communities to synthesizing values structure outputs. We discuss our findings and acknowledge important limitations in Section 5. Section 6 summarizes the paper, identifies research and practice contributions, and proposes next steps for this our research initiative.

2. **Methodologies and Methods**

Community-based operations research and community operational research

Our work is situated in the disciplinary areas of community-based operations research (CBOR) and community operational research (COR). COR, the longer-lived and more widely-known methodology of the two, is an approach to public-interest decision-modeling and decision-making for local impact that places special interest in: interventions to generate change in organizational processes and social outcomes; diversity of problems, problem-solving processes and techniques and approaches; local engagement and impact; concern for disadvantaged, underrepresented and underserved populations; problem-solving processes as well as outcomes; a critical approach and concern for ethics; qualitative and mixed-methods approaches to problem-solving, and community empowerment and social change (Bryant, Ritchie and Taket, 1994; Midgley, Johnson and Chichirau, this issue; Midgley, 2000). Community-based operations research, though closely related to COR, is an effort to bridge the gap between COR, which has been traditionally associated with qualitative research and community engagement, and operations research, which, as understood in the US context, is rooted firmly in quantitative models and mathematical analysis to generate data-based prescriptions and policies. As shown in Figure 1, CBOR expands the usual process, presented by authors in management science and operations research such as Albright, Winston and Zappe (2010), of problem identification, problem formulation, problem solution and implementation to allow variations in each of these steps that accommodate the special nature of community-based organizations' data needs, resources and mission, as described in the previous section. It allows for a problem-solving process to be collaborative, reflective of evidence of social impact of interventions to be modeled; inductive in the sense of 'learning by doing'; iterative, in the sense of gradual accretions of knowledge through community engagement

and collaborative problem-solving, and practice-focused, by which is meant problem-solving for local impact and social change.

[Figure 1: Process Diagram: Community-Based Operations Research]

Case study

The project described in this paper is a multi-site case study. The case study method (Yin, 2013) is a preferred approach design when "how" and "why" questions are being asked, when there is little control over the process or phenomenon under study, and the research focus is on current events and affairs. Case study is an inductive, theory-generating method that requires deep understanding of the problem context and often uses multiple methods for data gathering and analysis. Multi-site case studies are appropriate when there are multiple similar entities to be studied (agencies, neighborhoods, companies) and the goal is not to 'sample' cases randomly but instead to choose multiple cases that allow either replication of similar results or contrasting results for predictable reasons (Yin, 2013). For this paper, we apply our preferred analytic method, value-focused thinking, to multiple distinct Main Streets districts in the city of Boston that together represent the social and economic diversity of the city.

Participatory action research

Participatory action research (PAR) is both epistemology and a methodological approach for creating knowledge that is rooted in the belief that those most impacted by research should take the lead in framing the questions, design, methods, analysis and determining what products and actions might be the most useful in effecting change (Torre, 2009). PAR assumes that all people have valuable knowledge about their lives and experiences, the ability to develop strong critical analyses, and multiple identities. As an inductive and critical approach to generating knowledge, it recognizes that reflection, change and power dynamics are embedded in the process of studying people, organizations and systems. The project described in this paper is not, strictly speaking, an example of PAR but does embody the ethic that the process of developing changes in the way that Main Streets organizations report data on their operations and strategy will require not just the assessments of Main Streets directors but active input by diverse community stakeholders who might be critical of Main Streets, or disengaged from Main Streets' services and activities. It is this diversity of perspectives that only rises to the surface when primary field data are collected that is reflective of PAR's role in our project.

Problem structuring methods

'Doing' operational research (or COR, or CBOR) requires a clear understanding of the problem to be solved, through identification of decision alternatives that a decision-maker might choose from, and objectives that the decision-maker wishes to achieve. Problem structuring methods (PSMs) enable problems to be framed in a correct and appropriate context, enabling individuals and organizations to take practical steps towards addressing their data needs. Rosenhead and Mingers (2001) describe a wide range of PSMs – soft systems methodologies, drama theory, strategic approach and more – but these all have in common the features of (a) integrating multiple perspectives; (b) cognitive simplicity to engage participants; (c) operating intuitively and (d) engaging individuals as well as groups, and addressing problems as specific as necessary. For this project, a PSM approach is essential: while Main Streets directors could articulate the concerns they had with the current monthly data-reporting requirements, they lacked the technical capacity or theoretical understanding to articulate a process by which they could generate new metrics, as well as to identify the problems most-important to them that these metrics could help solve.

Value-focused thinking and Soft OR

Soft OR is a collection of decision-analytic methods that places less emphasis on mathematical modeling and solution generation and more emphasis on value judgments and active participation in model development (Ackerman, 2012). Value-focused thinking, originally developed by Keeney (1996), represents an application of multi-attribute utility through identifying, breaking down, and reconciling the values and desires of multiple parties to create decision opportunities that are in line with the objectives of the decision maker. The objective of VFT is to ensure decisions made by an individual or an organization is in line with their stated core values. To do this, VFT places upon the decision-maker the responsibility to articulate his or her own values, and to use these values to generate insights about alternative decisions to make, initiatives to design or strategies to pursue, objectives to optimize, and metrics, or criteria, by which progress towards meeting objectives can be measured. VFT thus shares attributes with problem structuring methods and soft-OR. We use VFT throughout this paper as a primary means by which Main Streets stakeholders can identify metrics and decision alternatives in order to reform the process by which Main Streets directors report performance metrics to city government each month.

3. **Research design and data sources**

The current study has its origins in a research project originally intended to assess the nature of data and analytic methods designed especially for community-based organizations to make better decisions regarding operations, tactics and strategy to better fulfill their missions (Johnson, 2015a). To better understand whether and how CBOs articulate their data needs, the level of knowledge of and access to expertise and technology to create appropriate information and whether CBOs have the capacity to identify and solve mission-aligned decision problems, Johnson convened a focus group of Boston Main Streets directors. During this focus group session, BMS directors expressed difficulty in identifying specific data elements that might be inputs to analysis to generate mission-relevant information, as well as identifying ways to measure, collect and analyze these data elements. Afterwards, BMS directors indicated their willingness to collaborate on a study focused specifically on the data analytic needs of Boston Main Streets. That agreement resulted in a collaboration with three Boston Main Streets directors dubbed the 'Data Committee'. Over the course of a year, investigators and the Data Committee – the research team - designed the current study, working together to identify research goals, research questions, data sources and analytic methods. It is this collaboration that we believe reflects the spirit of community operational research, as well as related analytic methods discussed above, such as participatory action research (Johnson, 2015b)

The research team agreed that Main Streets directors, though highly competent and committed to the success of economic development initiatives in their neighborhoods, could not be the only source of information about performance metrics and decision alternatives. Instead, the research team agreed that data collection would proceed along three tracks. First, the investigators would conduct interviews with select Main Streets directors and participate in walking tours of Main Streets districts led by the Main Streets directors to gain a better understanding of the communities in which they work. Second, the investigators would conduct a survey of all 21 Main Streets directors to learn what specific research questions would be the focus of the study, as well as the spatial and demographic characteristics of the Main Streets districts. Third, the investigators would conduct trial interviews with Data Committee members to validate the field data gathering instruments as well as findings from the BMS director surveys. Next, the investigators would, with the assistance of the Data Committee, identify stakeholder groups from which interview participants could be selected and make periodic assessments of the efficacy of the community engagement efforts. Last, the investigators would review and critique interim

research findings with the Data Committee, in preparation for presentation of draft final study results to all Main Streets directors, which occurred in July 2015.

4. **Findings**

Multi-site case study design

Our analysis started with identifying Main Streets districts within the city of Boston to serve as cases. With 21 separate Main Streets districts that differed greatly by socio-economic measures, it seemed unreasonable to choose stakeholders across these different districts for a single set of interviews. Thus, we conducted a survey of Main Streets directors to determine data that they wished to collect but lacked the capacity to do so, to learn how they used data in their day-to-day operations, biggest areas of concern in their districts, and the actual boundaries of their districts, as compared to official boundaries defined by their funding agency. Starting with verbal descriptions of the Main Streets districts, we used the MyNeighborhood Census Viewer (http://hubmaps.cityofboston.gov/myneighborhood/) to assemble Census blocks (the lowest level of enumeration) to construct individual Main Streets districts and aggregate Census data across these districts.

Results from this analysis were presented at a conference on public-interest data analytics in 2015 (Johnson and Jani, 2015). We found that Main Streets directors wished to collect data on business operations but did not have the means to do so; did not typically use data in their day-to-day operations; most valued metrics regarding parking, litter and waste management and crime, and had actual service areas that differed greatly from official boundaries. By aggregating Census measures such as race and ethnicity, age, fraction of households with children and housing tenure across custom-defined districts (see e.g. Figure 2 for race and ethnicity and Figure 3 for households with children), we identified three neighborhoods – East Boston, Upham's Corner and Hyde Park as, together, capturing the socio-demographic diversity of the city.

[Figure 2: Racial/Ethnic Diversity of Boston Main Streets Districts]

[Figure 3: Household Composition Diversity of Boston Main Streets Districts]

The locations of the three case study communities are shown in the map below (Figure 4).

[Figure 4: Candidate Main Streets Districts for Case Analysis]

Hyde Park, located in the far southern portion of Boston, is a community that has historically been majority white ethnic (Italian-American, primarily), but which has seen substantial in-migration of African-Americans, and African, Afro-Caribbean and Hispanic/Latino immigrants. Owner-occupied housing represents a much larger portion of its housing stock than the other three communities, and relatively few of its households have children. In contrast, East Boston, located in the far northeast portion of Boston and separated by the Boston Harbor from the primary portion of the city, has for many years served as a landing place for immigrants. This community is now overwhelmingly Hispanic/Latino, with a higher proportion of households with children and a higher proportion of housing units that are renter-occupied than in Hyde Park. Upham's Corner, in the northwest corner of the Dorchester community of Boston, is in turn the most racially and ethnically diverse of all three communities, has the highest percentage of households with children and has the highest percentage of housing units that are renter-occupied of the three target communities.

Main Street district stakeholder interviews

We then developed an interview strategy for stakeholders within these three neighborhoods. Consistent with our desire to engage with residents and those who did business in these neighborhoods, as opposed to only Main Streets directors, we identified four stakeholder groups within which we would identify interview subjects in order to develop values structures that could be analyzed to yield candidate metrics and decision alternatives associated with local economic development. These stakeholder groups were: business owners; property owners; residents and nonprofit community-based organizations. Our efforts also resulted in interviews with an administrator for the Boston agency that funds Main Streets districts, and two elected officials who were also residents of our candidate neighborhoods. We identified interview candidates through references from Main Streets directors, snowball sampling based on Main Streets directors' references, and a list of immigrant entrepreneurs provided by a local researcher.

To develop values structures, we conducted semi-structured stakeholder interviews. Our purpose was to collect enough data to construct means-ends networks (connecting fundamental values to specific decision alternatives) and fundamental values hierarchies (connecting fundamental values to specific performance metrics). Although one of us (Johnson) has applied Keeney's values-focused thinking methodology by creating draft values structures in real time during long-form focus group sessions (see e.g. Keisler et al., 2014 and Johnson et al., 2016, Chapter 5), we realized that such tactics would be excessively time-consuming and cognitively demanding if performed for each interviewee.

Therefore, we organized our interviews by asking questions chosen to identify specific goals that the stakeholders wished to achieve with their work. To elicit data by which means-ends networks could be created, we probed interviewees for examples of more-general or (fundamental) objectives that these elicited goals could help achieve, or more-specific (means-oriented) objectives that could be achieved if the goals in question could be met. To elicit data from which fundamental values hierarchies could be created, we probed interviewees for examples of more-general objectives for which the goals in question served as specific examples, and other, more-specific objectives for which the goals in question served as more general examples. In principle, continuing a line of questioning for means-ends networks would yield a range of decision alternatives each associated through a chain of causal reasoning with a most-fundamental objective; continuing a line of questioning for fundamental values structures would yield a range of metrics each associated through a chain of generalizations with the same, or highly-similar most-fundamental objective. Our interviews were approved by our university's Institutional Review Board.

In total we performed eighteen interviews with Main Streets stakeholders. Nearly half (44%) were business owners; four (22%) were nonprofit professionals; two apiece (22%) were property owners and elected officials, respectively, and one apiece (6%) were residents and city of Boston officials. Of the 17 interviews done with neighborhood-based stakeholders, nine (53%) worked or resided in East Boston; 5 (30%) were from Hyde Park and three (18%) were from Upham's Corner. For this paper, we present value-focused thinking-type analysis for six stakeholder interviews, two from each case study neighborhood. We focus on three interviews, one with a property owner in Hyde Park, another with a nonprofit professional in Upham's Corner and the last with a business owner in East Boston. Interviewee descriptions, values structures and details of performance metrics and decision alternatives for all six interviews are available in an on-line supplement to this paper.

Values analysis: Hyde Park property owner

The business owner we interviewed, an older white male, has managed properties in Hyde Park through his family-owned business that has been in existence for nearly a century. He has observed the social and economic transformation of the Hyde Park community, and noted social tensions associated with this transition. He wants Hyde Park's business district, called Cleary Square, to be successful, but sees barriers in terms of a reluctance of white residents to shop in businesses that are perceived to cater to nonwhites, a lack of technical capacity of minority-owned businesses, and lack of variety of businesses types in the district. Diversity and cross-cultural understanding appeared very important to

him, and he seemed to be quite technically astute in terms of business fundamentals, and aware of social dynamics within the community.

The means-ends network that we were able to create based on our interview with this stakeholder (Figure 5) consists of a most-fundamental value, 'maximize community health' linked to two more-tangible means objectives, 'maximize residential quality of life' and 'maximize business viability and longevity'. By extending our analysis towards more specific objectives that could achieve these more-fundamental objectives, we see evidence of a range of candidate decision alternatives associated with increased perception of safety, increased consumer choice, increased physical access to the shopping district, increased diversity of clientele, increased consumer spending and increased technical and professional support to existing and potential entrepreneurs.

[Figure 5: Means-Ends Network: Hyde Park Property Owner]

The fundamental values hierarchy we created has the same set of first-and second-level fundamental objectives as the means-ends network, but proceeds to decompose these objectives according to more-specific ways by which they could be achieved (Figure 6). For example, the objective 'maximize business health' is associated, eventually, with metrics such as 'size of reserve fund', 'Web visibility of business', 'traffic congestion' and 'visual appeal'; the objective 'maximize health of consumer base' is associated with metrics such as prevalence of full-price stores, versus discount and second-hand stores, and measures of cultural accommodation according to language spoken by merchants and customers, race and ethnicity of merchants and customers, and the level of awareness of cultural norms and expectations ('cultural competence').

[Figure 6: Fundamental Values Hierarchy: Hyde Park Business Owner]

These values structures appear to be very helpful in enabling businesses in Hyde Park to be more financially successful and to make stronger contributions to the social and cultural diversity of Hyde Park.

Values analysis: Upham's Corner nonprofit professional

The nonprofit professional we interviewed who is based in Upham's Corner is a younger African-American male who worked at a local community center. As manager of workforce development, he sought to help young people advance in academics, athletics, entrepreneurship and personal development. His core values were focused on collective action to improve a high-poverty and high-crime community, on the basis of 'love': of individual residents for themselves, for others, and for the

neighborhood. His comments were infused with a strong faith for the young people his organization serves and a desire to help them succeed.

The means-ends network we created based on our interview with this individual has as its most-fundamental value that of 'maximizing community love', which might be achieved through maximizing 'pride in the community' and a 'sense of empowerment' (Figure 7). Specific actions that might be pursued to achieve pride in the community include sponsoring community social and cultural events, neighborhood clean-ups, improved policing and neighborhood watch efforts, increasing opportunities for local entrepreneurship and increasing the level of local hiring of neighborhood businesses. Actions to increase a sense of empowerment include access to local elected representatives and administrators, increased volunteer opportunities and strengthened social institutions.

[Figure 7: Means-Ends Network: Upham's Corner Nonprofit Professional]

The fundamental values hierarchy we created for this nonprofit professional (Figure 8) has the same most-fundamental value, 'maximize community love', but decomposes it into three complementary objectives related to 'physical environment', 'social and economic environment' and 'business environment'. Specific metrics associated with each of these include: affordable housing options, places for young people to congregate, neighborhood efficacy, rapport with and faith in city representatives and administrators, and local shopping and cultural resources.

[Figure 8: Fundamental Values Hierarchy: Upham's Corner Nonprofit Professional]

This interview was striking for the strong emphasis on concepts related to community engagement, efficacy and social/emotional health that are not often present in discussions of economic development. We interpret these findings as indicating a broader notion of local economic health, inasmuch as the needs and desires of young people are not often accounted for.

Values analysis: East Boston business owner

The business owner in East Boston we interviewed is in his forties, runs a Latin American restaurant, a native of Columbia and a recent newcomer to East Boston. He expressed concerns that East Boston, which is rapidly gentrifying as professionals, who are predominately white, enter the neighborhood seeking affordable housing, are displacing Latinos who have traditionally used the neighborhood as a point of entry to the U.S. He feels that Latino-owned businesses are not being promoted to new

residents, and would like to see business owners like him receive more assistance from Boston Main Streets in navigating the city of Boston's bureaucracy.

The business owner's means-ends structure (Figure 9) starts with a fundamental value of creating a 'welcoming and inclusive neighborhood' which can be better achieved through encouraging diverse businesses, diverse opportunities for social and economic growth of residents, and increased technical and administrative support to businesses. These means objectives are in turn associated with potential initiatives such as better promoting the neighborhood to new residents and visitors, allowing residents to take a more active role in neighborhood social and cultural activities, improving the quality of physical infrastructure around local businesses, and balancing the needs of businesses who cater to immigrants as well as longer-time residents, who are predominately white.

[Figure 9: Means-Ends Network: East Boston Business Owner]

To identify metrics of economic development relevant to this business owner, we decomposed his fundamental value, 'welcoming and inclusive neighborhood' across three dimensions: 'business stability', 'resident stability' and 'self-empowerment' (Figure 10). Successive decompositions of these objectives yielded a range of candidate metrics, such as measures of business productivity and resident employment that will ensure employee stability in the neighborhood, measures of rental housing market affordability and residential mobility that are associated with stability of customer markets for existing businesses, and more subjective notions of opportunities for personal growth, autonomy and optimism about the future that are associated with residential sense of control and influence.

[Figure 10: Fundamental Values Hierarchy: East Boston Business Owner]

Cross-case analysis

To make sense of our interview findings, we identified dominant themes (more-general objectives) that appeared to be associated with candidate metrics (leaves of the fundamental values hierarchies), as well as dominant themes (means objectives) that appeared to be associated with candidate decision alternatives (leaves of the means-ends networks) (Table 1). While measures of business effectiveness, technical capacity and ability to make use of technical assistance offered by Main Streets organizations were predominant among business owners and property owners, as expected, measures of social impact, residential health, diversity and engagement between businesses and customers were present among business and property owners as well as the nonprofit professional in our interview sample. We also found that candidate decision alternatives such as those to improve Main Streets support to local

businesses, improve the physical attractiveness of the local environment and increase the technical capacity of local businesses were present among business owners and property owners, as expected, proposed initiatives to meet the needs of different community groups, increase community engagement and quantify the impacts of business activities on local residents were present among means-ends networks across all interviewees. This is an indication that local stakeholders appear to prize metrics and decision alternatives associated with social impact, community health and local engagement as well as more-traditional notions of demand assessment, physical improvements and business technical ability that one would normally expect for-profit stakeholders to value.

[Table 1: Dominant Themes for Metrics and Alternatives, All Communities and Stakeholders]

5. **Discussion**

Research findings

A number of themes have emerged from our construction and analysis of values structures associated with stakeholders living in or doing business in three select Main Street districts in the city of Boston. We found that issues of residential and business stability and responding to needs of non-English-speaking/immigrant communities was prominent in East Boston, probably because of the current levels of gentrification occurring there. Concerns with self-empowerment and community efficacy were particularly strong in East Boston and Upham's Corner, the two Main Streets districts with the largest non-white populations, located in city-defined neighborhoods with the highest poverty rates. We were struck that two seemingly contrasting concerns: of technical assistance and advocacy for local businesses, and diversity, of sustainability, of community engagement and impact were themes that resonated across all communities and stakeholders. This is an indication that traditional notions of local economic development need not work at cross-purposes with social justice and equity concerns. We note as well that stakeholders' values yielded ideas for metrics and decision alternatives focused not just on business skills of and technical and financial resources available to local businesses, but those of Main Streets organizations as well. A summary of the prevalence of various themes associated with our values analysis across neighborhoods and stakeholders is contained in Table 2

[Table 2: Top Metrics Categories, All Communities and Stakeholder Groups]

One concern we had regarding our multi-site case study approach was that the values structures, in content as well as form, might differ so greatly across communities and/or stakeholder group that a

focus group and a more-traditional long-form real-time VFT session might be required. The cross-case analysis in the previous section and the themes analysis in this section indicate that we may consider aggregating the values structures across all participants. The composite structures that would result – a means-ends network and fundamental values hierarchy – would yield candidate decision alternatives and performance metrics that could be said to capture, at least, the values and preferences of the three Main Streets communities that participated in our study. Given that the three communities we studied were chosen precisely to capture the diversity of Boston overall, a case could then be made that these composite values structures could represent all 21 Boston Main Streets districts.

Recommendations for policy and practice

We now address the original goal of our research collaboration with Boston Main Streets, the choice of specific candidate metrics which, if collected, might enable Main Streets districts to best support local businesses, residents and visitors. Table 3 contains, for each metric category that appeared in Table 2, the community stakeholder to which the metric category is associated and specific quantifiable entities associated with these metrics. Some sample metrics, such as 'Distribution of business types', 'Median tenure of businesses' and 'Median length of time to obtain licensing from the city' can possibly be extracted from existing administrative datasets. However, quantifying other sample metrics, such as 'Content analysis of Boston Main Streets promotional materials;', 'Number of business owners involved in community events', 'Resident preferences for locally-purchased products and services' and 'Level of satisfaction of local residents and customer base regarding cultural engagement with local businesses' would require new surveys and in-person canvassing – resource- and knowledge-intensive activities that are probably beyond the capacity of small, lightly-staffed Main Streets offices.

[Table 3: Analysis of Metrics: Sample Measures]

While Boston Main Streets district directors have not yet approved detailed recommendations such as those contained in Table 3, the BMS directors, including the Data Committee, have reviewed preliminary findings, including values structures for the six interviewees and dominant themes arising from our analysis. The response has been strongly positive; the directors appear supportive of the empirical nature of our research project, our commitment to qualitative and quantitative analytic methods, and the substantive content of the themes we have identified across the values structures we have created. They believe that the metrics arising from this project could eventually replace those that they have been required to report to their funding agency to date.

Based on our research findings and initial feedback from Boston Main Streets directors, we identify a number of recommendations for economic development policy in Boston's neighborhoods, and routine practice by Main Streets organizations. BMS organizations may wish to consider identifying and reporting metrics that capture broader and more fundamental notions of business and community health, as experienced by customers and local residents. While place-building, business recruitment and support and advocacy are always important Main Street activities, issues of diversity, engagement and representativeness should not be ignored, even if they are hard to measure. Metrics and alternatives related to Main Street organizations, as contrasted with local businesses, are important to local stakeholders, and may encompass more complex outcome measures than number, frequency and attendance at community meetings and an overall level of approval with the Main Streets office's operations. Our recommendations are likely to result in changes to the current model of performance measurement, whereby Main Streets directors, on their own, complete a computer-based survey of metrics defined by their funding agency. Instead, BMS directors may measure some metrics frequently, say, monthly, and others periodically, say, yearly. Many metrics will require customized surveys, canvassing and assessments. As a result, a research assistant, supported by the funding agency and supporting all of the Main Streets offices may be appropriate for a more sophisticated data collection policy.

Answering the research questions

We return to the research questions that motivated this project. By creating values structures based on interviews with local stakeholders engaged with or affected by the work of selected Boston Main Streets organizations, we have identified measures of local economic development success that are improvements over the status quo, that are associated with relevant theory. However, it appears premature to assert that the metrics we have identified are easily quantifiable; doing so will require resources and technical expertise not currently present at the various small Main Streets district offices. Second, we assert that we can and have identified decision alternatives to achieve local economic development success that are improvements over the status quo. While concepts of increased technical capacity and business administrative and operational support for Main Streets businesses, and of increased attention to issues of diversity, community engagement and social impact of economic development activities were common across all case study communities and nearly all stakeholder groups, we found particular interest in metrics and decision opportunities related to gentrification and related neighborhood change expressed by stakeholders from East Boston. We also found particular

interest in self-empowerment and community efficacy among stakeholders from East Boston and Upham's Corner, whose local populations are more heavily minority and lower-income than those in Hyde Park. Overall, the values structures we have created, collectively, have the potential to provide tangible guidance and insight to local economic development professionals without the need for additional focus groups to resolve conflicts and disparities across case communities and stakeholder groups. Therefore, these structures can serve as a basis for decision models whose prescriptions can support the work of Boston Main Streets organizations.

Limitations

Our research has been limited by the lack of evidence in support of the uses to which we have put VFT for the current project. Earlier in this paper we reviewed a range of analytic methods relevant to this project, including participatory action research, problem structuring methods and value-focused thinking. We asserted that Keeney's VFT appeared to best-suited to our research needs, as it embodied key principles of decision modeling (objectives, decision variables, constraints) while being agnostic as to the particular decision modeling approach that insights derived from its use might support (e.g. multi-criteria decision models, stochastic models, optimization models).

Having used VFT as an organizing principle and an analytic method throughout this project, we are aware of the technical and cognitive challenges associated with performing multiple time-constrained stakeholder interviews in order to derive, ex post, values structures. The VFT literature that addresses the challenge of values structuring using derived and secondary data is recent and limited. There is not known to us a technology that can automate or standardize the process of creating and analyzing values structures akin to the various software packages available to perform decision analysis through decision trees or influence diagrams. We do not know of research that provides empirical support for a focus group-oriented approach to VFT (see e.g. Keisler et al., 2014; Johnson et al., 2015) as compared to the interview-based approach we have used in this paper. There is very little research literature known to us on best practices for performing analysis across multiple values structures and aggregating multiple values structures to generate policy insights. We know of no studies that compare VFT as a data gathering and analysis tool to other methods common in the social sciences such as quantitative content analysis (see e.g. Neuendorf, 2001) and qualitative methods such as coding, pattern matching and discourse analysis (see e.g. Maxwell, 2012). Finally, the literature on mixed methods such as VFT as

applied in a decision modeling context is quite limited, as compared to the many discussions of mixed methods in the social sciences (see e.g. Creswell, 2013; Cresswell and Plano Clark, 2011).

Another limitation of our work is the limited theoretical support for the notion of value-focused thinking as an analytic method that is or can be adapted to be well-aligned with the principles and goals of community operational research and community-based operations research, in contrast to, for example, problem structuring methods and soft OR.

6. **Conclusion**

Summary

This paper has applied Keeney's value-focused thinking approach to decision modeling, in a context of community-based operations research/community operational research and participatory action research to identify values of community stakeholders in the city of Boston who work with Boston Main Streets organizations to enrich local economic development. These values, represented by means-ends networks and fundamental values hierarchies for each of six people interviewed across three Boston Main Streets districts and six stakeholder categories, yielded sets of potential performance metrics and decision alternatives. Analysis of the performance metrics indicated a great deal of commonality across socially and economically diverse communities; this provided justification for us to aggregate our collection of performance metrics into a single set of metrics that can serve as the basis for a new strategy for data collection, analysis and management by local Main Streets directors. We learned that, though traditional conceptions of business recruitment, marketing and place-making are in fact important to community stakeholders, so also are concepts of social justice, diversity, community engagement and social impact. Though the latter measures may be more challenging to quantify than the former measures, we are inspired by current research on 'community resiliency' (Spaans and Waterhout, 2016) that has enlarged the conception of community infrastructure and local development and is consistent with our findings.

Contribution to theory and practice

Our work has made a number of contributions to research. The values structures we have created, and the performance metrics and decision alternatives associated with them, represent an effort to bridge the gap between the technical sophistication and data management requirements associated with contemporary data analytics and the expressed data needs of CBOs and urban nonprofits (Johnson,

2015). Through our collaborations with Main Streets directors and engagement with community stakeholders, we have attempted to counter the narrative that residents lack agency according to the conventional conception of Smart Cities and Big Data (Chourabi et al., 2012). Our novel data collection process, in which structured interviews followed by values structure elaboration replaced the tradition of multi-person focus groups in which approximations to values structures are created in real time, allowed us to view values structures as data elements that can be aggregated and consolidated so as to reflect the perspectives of diverse groups. By pursuing a strategy of co-creation of the research project with the Data Committee of Boston Main Streets and close engagement with community partners, we adapted and combined practices from a number of traditions, particularly community-based operations research (Johnson, 2012) and participatory action research (Torre, 2009).

From a practice perspective, we have enabled resource-constrained, mission-driven and community-based economic development professionals to articulate an evidence-based approach to identifying performance metrics and decision alternatives that enables them to work on a more equal basis with the city agency which provides much of their funding and direction. As an academic-community collaboration, our work demonstrates the importance of expertise and technology provided by universities to nonprofits, as well as the clarity and direction provided by well-defined needs of community practitioners (Sodhi and Tang, 2010).

Next steps

We plan to revise our research findings based on feedback from Boston Main Streets directors and the community stakeholders we interviewed for this study. We look forward to working with the city of Boston and Boston Main Streets to enable BMS directors, with proper technical support, to collect and productively make use of a wider range of data related to Main Streets operations and strategy than has been the case in the past. Our process for cross-case analysis relied on qualitative assessments of themes and trends both in the topology of values structures and the information contained within them. We would like to formalize this approach by developing data tables that would encode the information associated with each element within a values structure. Such a relational database, an extension of the analytic strategy of Keeney et al. (2014) could allow us to more rigorously test hypotheses regarding similarities and differences across values structures according to geography, stakeholder type or other criteria. This paper presented analytic results for six of the eighteen interviews we have conducted; we hope to complete analysis for all of the interviews for a follow-on paper and perhaps a doctoral dissertation. We would also like to design decision models that incorporate the performance metrics

and decision alternatives developed in this study so as to provide tangible guidance to Main Streets directors regarding the choice of projects and initiatives to pursue that optimize objectives most salient to their organizations' missions.

Acknowledgements

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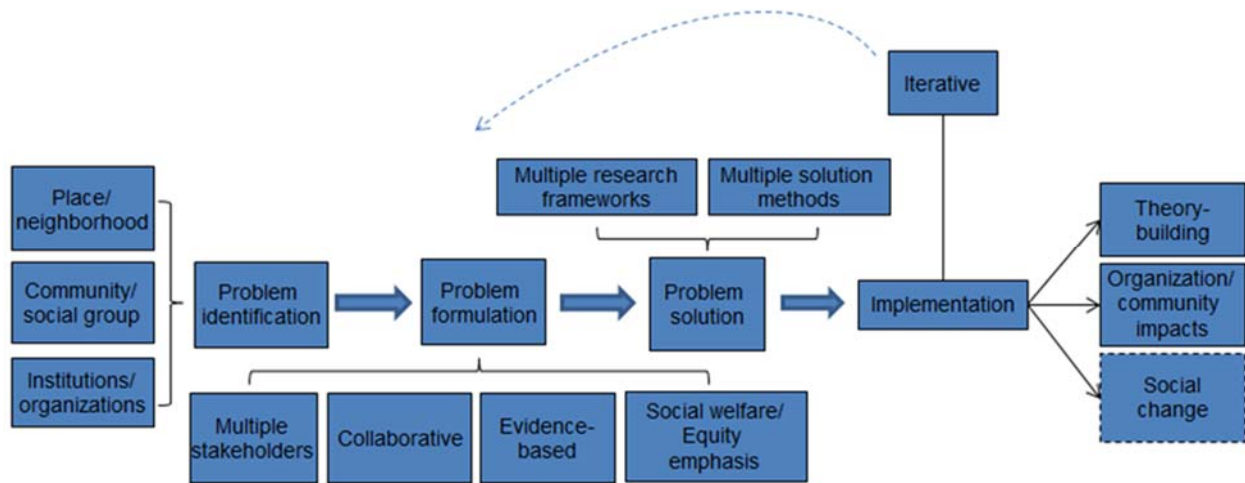
Tables and Figures

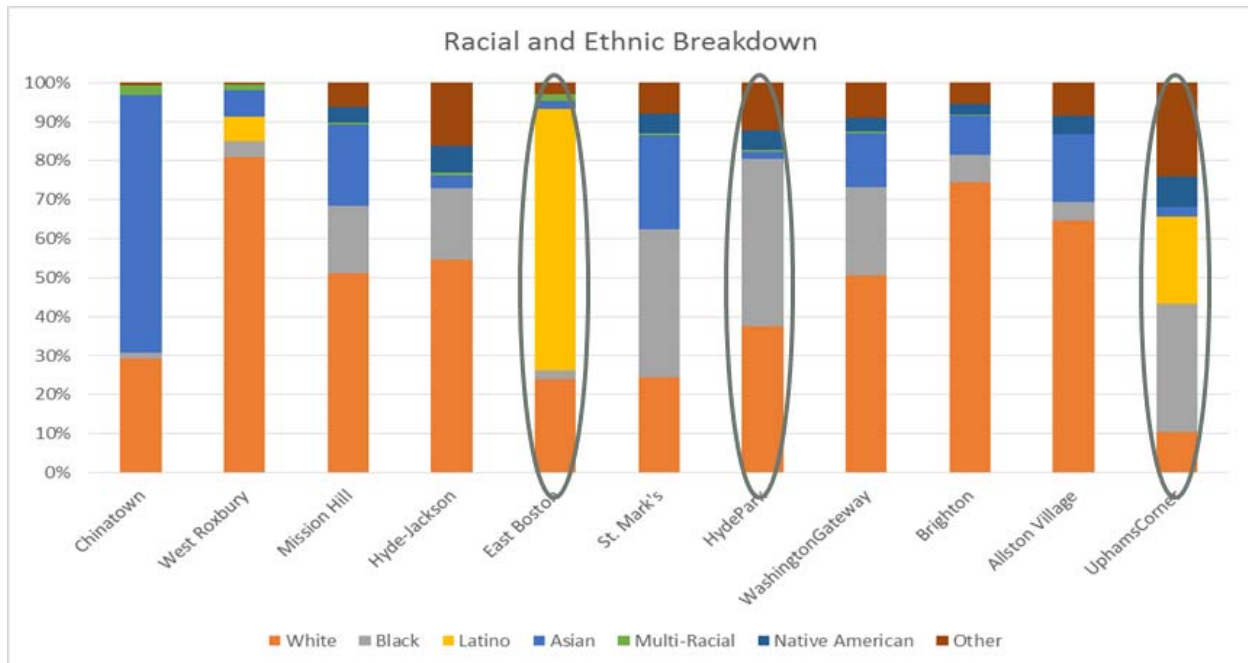Figure 1: Process Diagram: Community-Based Operations Research

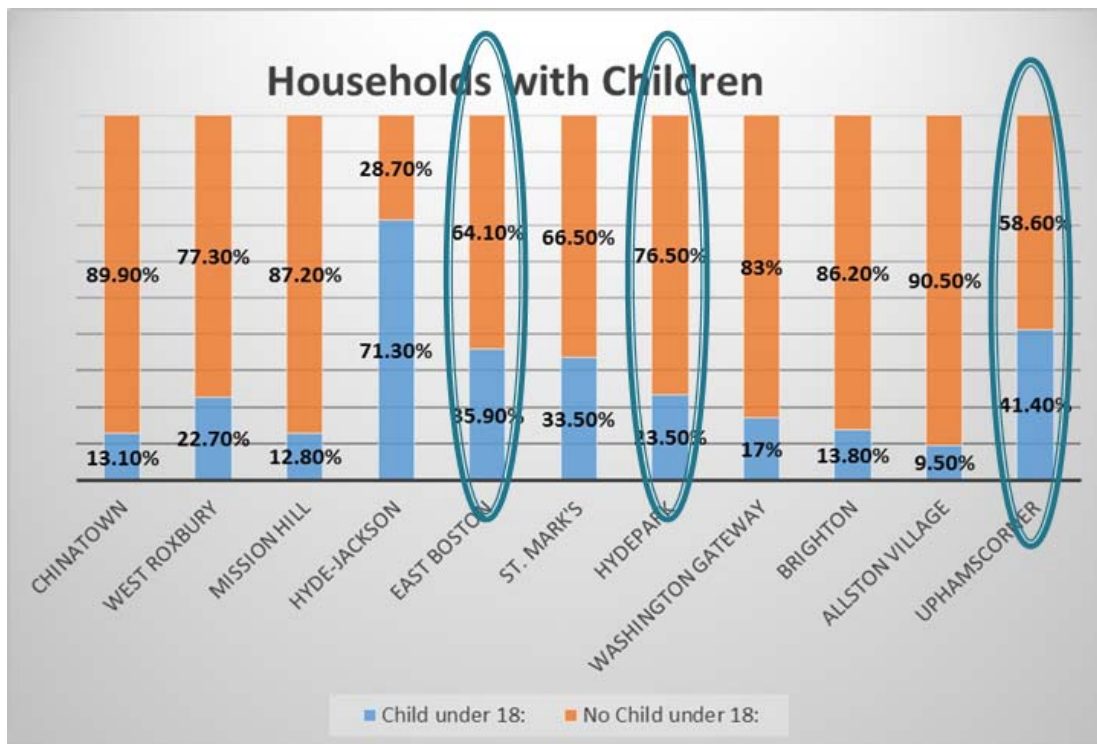Figure 2: Racial/Ethnic Diversity of Boston Main Streets Districts

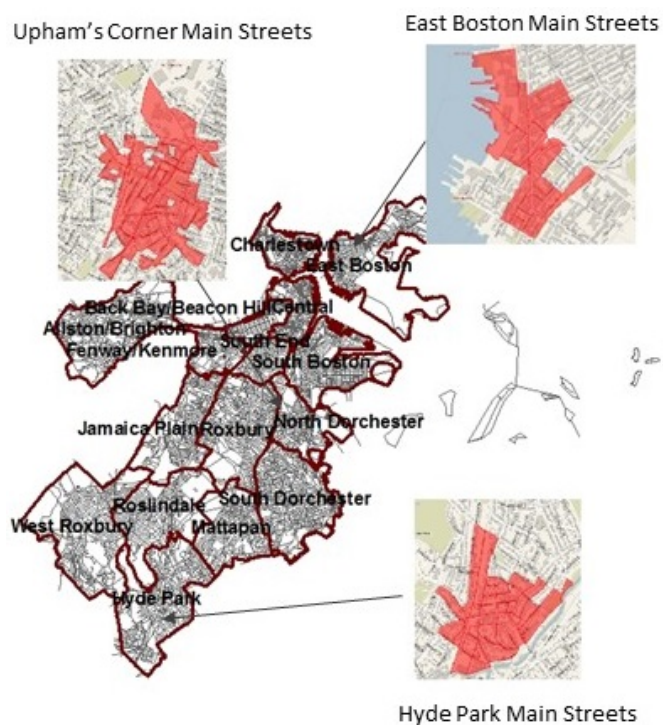Figure 3: Household Composition Diversity of Boston Main Streets Districts

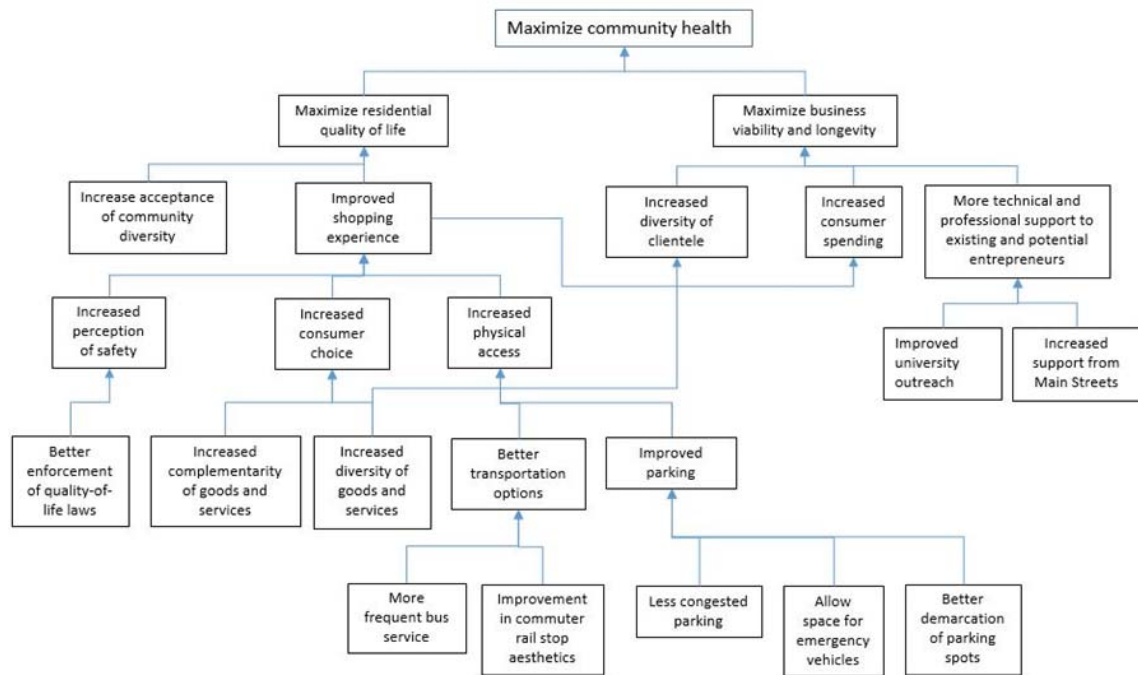Figure 4: Candidate Main Streets Districts for Case Analysis

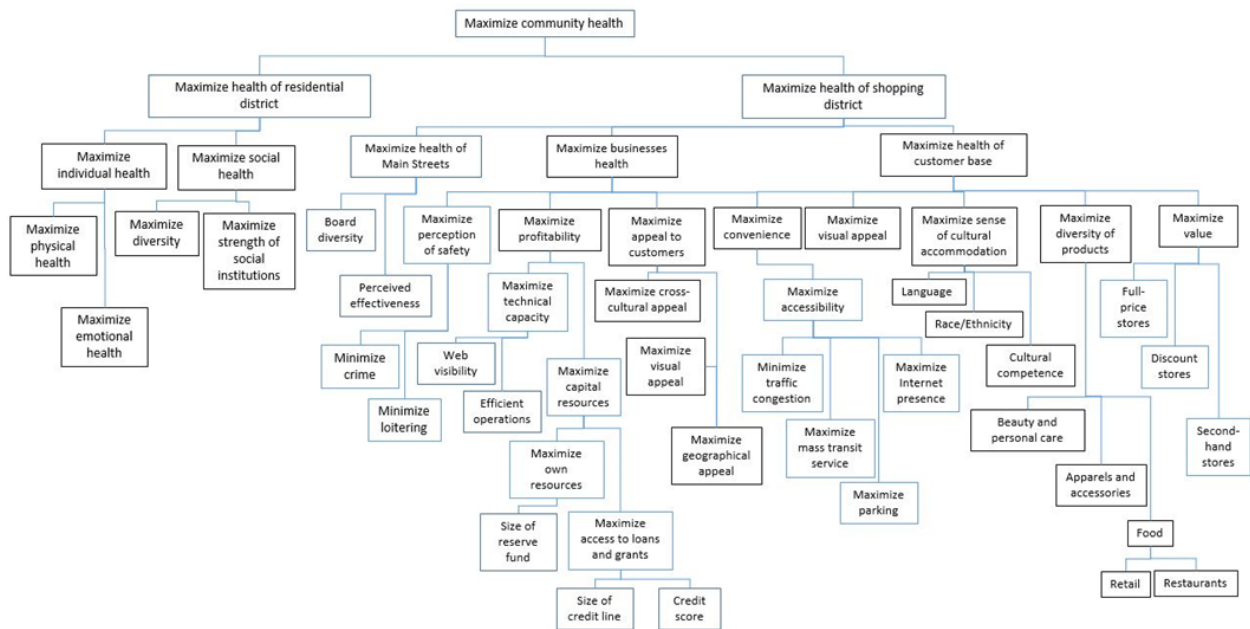Figure 5: Means-Ends Network: Hyde Park Property Owner

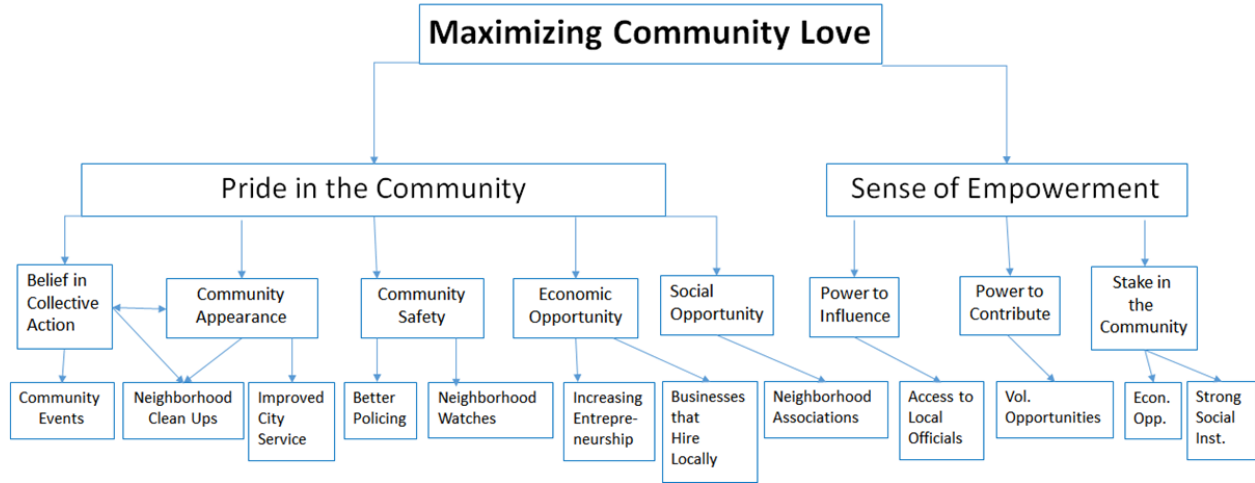Figure 6: Fundamental Values Hierarchy: Hyde Park Business Owner

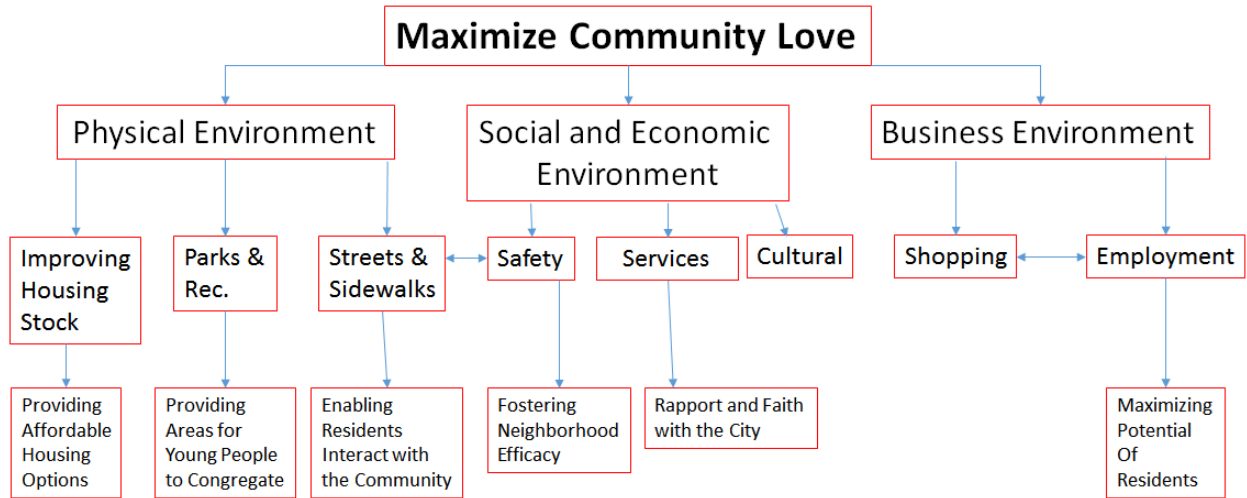Figure 7: Means-Ends Network: Upham's Corner Nonprofit Professional

Figure 8: Fundamental Values Hierarchy: Upham's Corner Nonprofit Professional

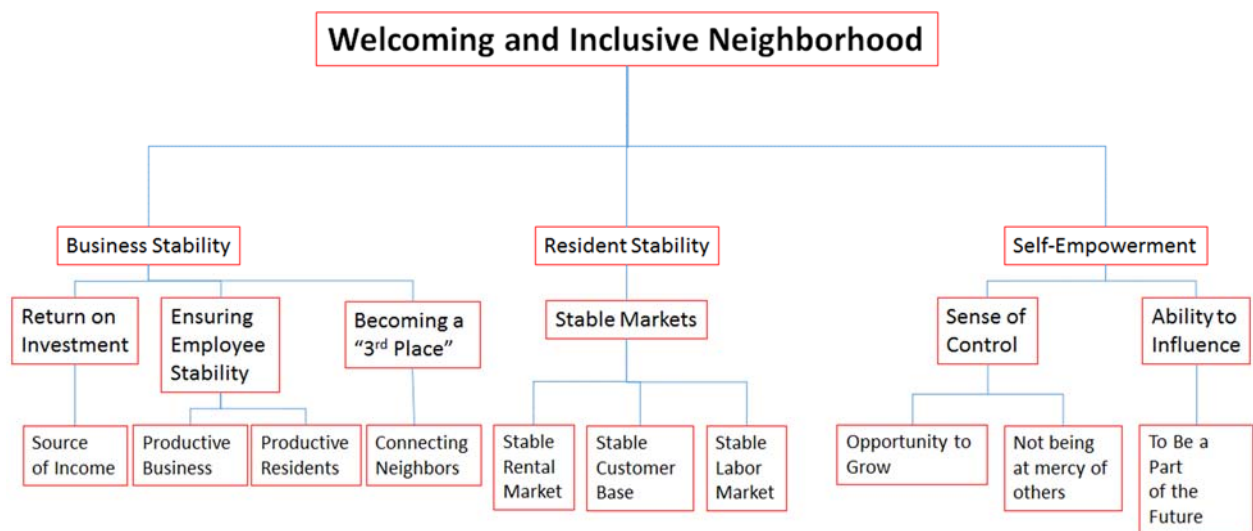Figure 9: Means-Ends Network: East Boston Business Owner

Figure 10: Fundamental Values Hierarchy: East Boston Business Owner

Community	Stakeholder Type	First dominant theme - metrics	Second dominant theme - metrics	Third dominant theme - metrics	Fourth dominant theme - metrics	First dominant theme - alternatives	Second dominant theme - alternatives	Third dominant theme - alternatives
Hyde Park	Business owner	Effectiveness of Main Streets organization	Business viability	Diversity, within Main Streets, of shopping options	Local engagement and local employment	Increase Main Streets support to businesses	Increase health of individual businesses	Increase engagement with and understanding of diverse community
Hyde Park	Property owner	Maximize health of customer base	Maximize health of residential community	Maximize business health	Maximize health of Main Streets	Increase perception of safety	Increase consumer choice	Increase consumer diversity and understanding of community diversity
East Boston	Business owner (male)	Self-empowerment of entrepreneur	Business stability	Residential stability		Meet the needs of different community groups	Increased tangible support by Main Streets for businesses	Ensure diverse social, cultural and economic opportunities for local residents
East Boston	Business owner (female)	Connecting businesses and people	Neighborhood equity	Building a neighborhood identity		Maximize economic opportunity and socio-economc diversity	Maximize physical attractiveness	Support stable housing market
Upham's Corner	Nonprofit professional	Physical environment: housing and recreation	Social environment: neighborhood efficacy and engagement	Business environment from perspective of residents		Increase community improvement activities that tie residents together	Increase local entrepreneurship and employment	Increase volunteer and economic opportunities that tie residents to the community
Upham's Corner	Business owner	Measures of connecteness between businesses and engagement with customers	Measure social impacts of business and nonprofit operations	Measure technical capacity of businesses		Increase participation in Main Streets activities	Increase skills and capacity of local employers through basic skills education	Quantify impacts of organization goods, services and activities upon local community

Table 1: Dominant Themes for Metrics and Alternatives, All Communities and Stakeholders

Community/Stakeholder	Top Metrics Categories
Hyde Park Business Owner; Hyde Park Property Owner; East Boston Business Owner (male)	Business health, stability, empowerment and viability
Hyde Park Property Owner; Upham's Corner Business Owner	Maximize health of customer base and residential community through social impacts of business and nonprofit operations
Upham's Corner Nonprofit Professional	Physical environment: Housing and recreation
Hyde Park Property Owner; Hyde Park Business Owner	Health and effectiveness of Main Streets organization
East Boston Business Owner (female); Upham's Corner Business Owner	Connect businesses and customers
Hyde Park Business Owner	Local engagement and employment
Upham's Corner Business Owner	Technical capacity of businesses
Hyde Park Business Owner	Diversity of shopping options
East Boston Business Owner (female); East Boston Business Owner (male); Upham's Corner Nonprofit Professional	Neighborhood equity, stability, efficacy and engagement
East Boston Business Owner (female)	Neighborhood identity

Table 2: Top Metrics Categories, All Communities and Stakeholder Groups

Community /Stakeholder	Top Metric Catagories	Sample Metrics
Hyde Park Business Owner	Business Health; Stability	Number of years in business Median/average number of years in business, across communities and business types
Hyde Park Property Owner	Empowerment and Viability	Access to capital Average amount of credit available # of Business owners invoved in community events
Hyde Park Property Owner	Maximize Health of Consumer Base and Residential Community Through Social Impact of Business and Nonprofit Operations	Level of satisfaction of businesses regarding cultural engagement with local residents and customer base Level of satisfaction of local residents and customer base regarding cultural engagement with local businesses
Upham's Corner Nonprofit Professional	Connect Businesses and Customers	Number of community events Number of customers who live in the neighborhood
Hyde Park Business Owner	Local Engaagement and Employment	Employment rates for the district & neighborhood Industrial sectors which residents are employed In
Upham's Corner Business Owner	Technical Capcity of Businesses	Education of business owners Number of businesses with an Internet presence (Facebook, Twitter, website, etc) Age of business owner Immigrant Status of Business Owner
Hyde Park Business Owner	Diversity of Shopping Options	Distribution of business types: restaurant, retail, FIRE, etc. Resident preferences for locally-purchase products and services Distribution of business price points: full-price; discount; second-hand
East Boston Business Owner (female)	Neighborhood Equity and Stability	Median tenure of business Median tenure of residents Median income of resident Number of Subsidized/Affordable Housing Units
East Boston Business Owner (male)	Efficiency and Engagement	Median length of time to obtain licensing from the city Median length of time for businesses to obtain services from Main Streets
East Boston Business Owner (female)	Neighborhood Identity	Content analysis of Main Streets promotional materials
Hyde Park Business Owner	Health and effectiveness of Main Streets organization	Racial, ethnic and gender diversity of Main Streets membership Business diversity of Main Streets membership (profession/business type of members)

Table 3: Analysis of Metrics: Sample Measures